United States
Department of
Agriculture

Forest Service

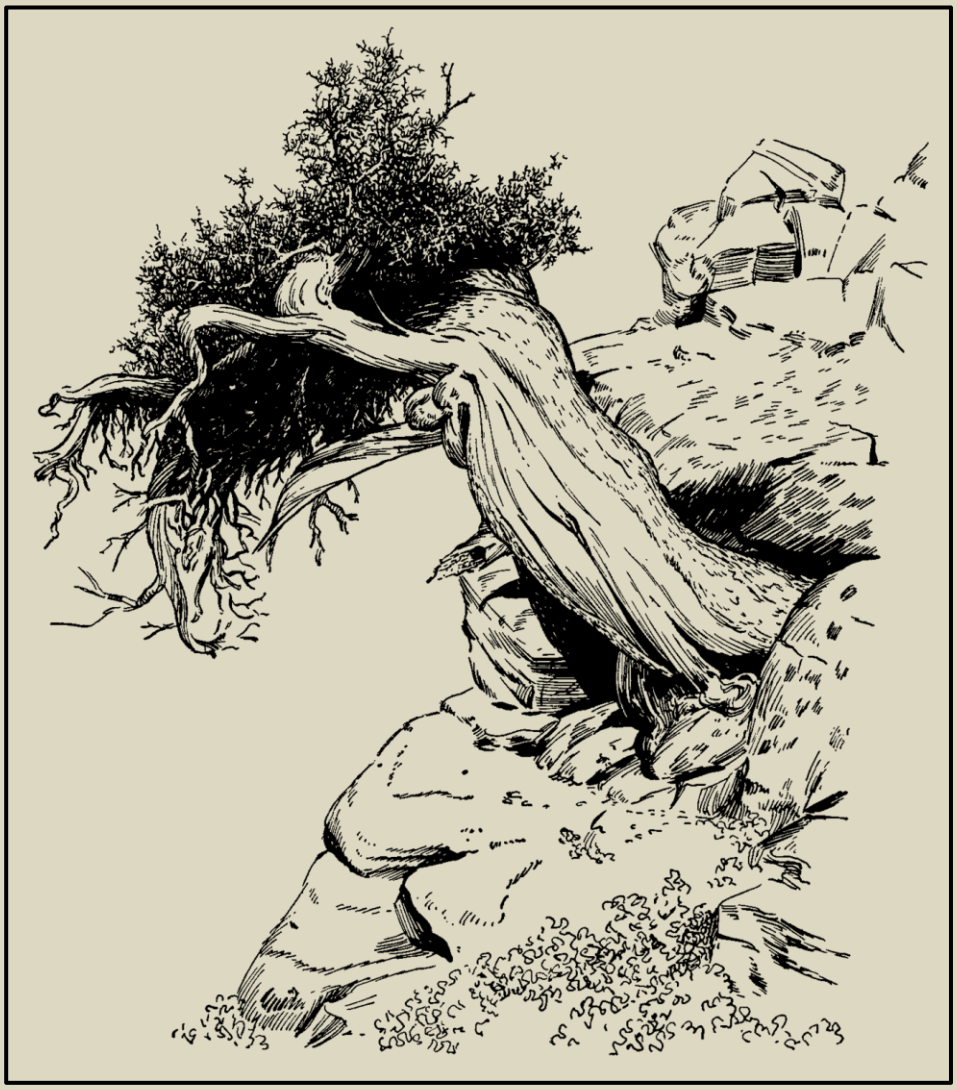
Pacific Northwest
Region

**Umatilla National
Forest**

F14-SO-TP-05-99
May 1999

Historical References About Vegetation Conditions: A Bibliography With Abstracts

David C. Powell



Author

DAVID C. POWELL is a silviculturist, USDA Forest Service, Umatilla National Forest, 2517 SW Hailey Avenue, Pendleton, Oregon 97801.

Abstract

Ecosystem analysis at the watershed scale is a six-step assessment process that characterizes the human, aquatic, riparian, and terrestrial conditions in a watershed. One of the six steps involves characterization of reference conditions, which establishes an historical context for describing how ecosystem elements have changed over time because of human influence and disturbance processes. It would be preferable to study ecosystems undisturbed by humans as a way to characterize reference conditions, but since undisturbed ecosystems are seldom available for study, historical information sources are used to infer what reference (pre-settlement) conditions were like. The objective of this document is to summarize 983 historical reference materials included in the history archives of the Umatilla National Forest silviculture library. Appendix 1 provides an index of the references; appendix 2 summarizes each historical accession in a standard bibliographic format, including an abstract, keywords and selected ancillary information (notes, size, etc.) when appropriate.

Keywords: Reference conditions, ecosystem analysis, historical documents, vegetation conditions, Blue Mountains, historical range of variability.

Acknowledgements

Many people have assisted with the silviculture library history archives over the last six years. My sincere thanks and appreciation are extended to all of them! STEVE BURNS (Supervisor's Office), ERIN HARRAL (Pendleton High School volunteer), and BETSY KAISER (Walla Walla Ranger District) helped with filing and labeling. CHARLENE BUCHA-GENTRY (Heppner Ranger District) and DON JUSTICE (Supervisor's Office) helped acquire and duplicate reference materials from the National Archives in College Park, Maryland. DAVE KENDRICK (Heppner Ranger District) provided copies of historical reforestation records. CATHY WIESE (Walla Walla Ranger District) provided historical documents and photographs.

MARTY KING (Supervisor's Office) has been interpreting the Government Land Office survey notes for 120 townships that occur within or adjacent to the Umatilla National Forest. TEENA HAZEL, a temporary services employee, transcribed 58 reports from the early 1900s so they could be distributed electronically. LINDA DILLAVOU (Supervisor's Office) has been transferring electronic versions of transcribed reports to the Forest's internet site. KIM JONES and ELLA WARNER (Supervisor's Office) helped by digitizing several historical maps so they could be used with the Forest's GIS system.

LES HOLSAPPLE and JOHN KEERSEMAKER (Supervisor's Office) helped locate historical materials at the University of Washington libraries in Seattle. MICHAEL HAMPTON (Supervisor's Office) helped acquire reference materials from the Pacific Northwest Region of the National Archives in Seattle. DON JUSTICE helped enter information about historical photographs into the library management software called ProCite. STEVE BURNS catalogued, sorted, and filed 38,687 historical aerial photographs dating from 1937 to 1981. JOANI BOSWORTH (Supervisor's Office) helped with publication arrangements for this document.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Historical References About Vegetation Conditions: A Bibliography With Abstracts

David C. Powell

USDA Forest Service
Pacific Northwest Region
Umatilla National Forest
2517 SW Hailey Avenue
Pendleton, Oregon 97801

Technical Publication F14-SO-TP-05-99
May 1999

TABLE OF CONTENTS

Introduction 1
Reference conditions: concepts and terms 2
Historical reference materials 3
Literature cited 4
Table 1: Summary of transcribed reference materials from the history archives 5
Appendix 1: Index of reference materials in the silviculture library history archives 7
Appendix 2: Reference materials in the history archives: a bibliography with abstracts 35

INTRODUCTION

Ecosystem analysis at the watershed scale is an assessment process that characterizes the human, aquatic, riparian, and terrestrial conditions in a watershed. It is a systematic process for understanding and organizing ecosystem information in order to assess the impacts of management activities and disturbance processes. The understanding gained from ecosystem analysis is critical for helping to sustain the health and productivity of natural resources administered on behalf of the American people (Regional Ecosystem Office 1995).

Federal agencies view watershed analysis as an opportunity to shift their focus from individual species and sites to the larger ecosystems that support them. It is believed that this change in perspective will improve understanding about the ecological consequences of management actions before they are implemented. A watershed is used as the analysis unit because it represents a mid-scale land area with relatively homogenous features and processes, at least from a hydrologic standpoint (Regional Ecosystem Office 1995).

Ecosystem analysis at the watershed scale is a six-step process:

- Characterization - identification of ecosystem components, structures, and processes as they relate to an analysis area.
- Issues and Key Questions - focuses the analysis by placing key issues and questions in the context of a watershed.
- Current Conditions - develops detailed information about the range, distribution, and condition of key ecosystem elements.
- Reference Conditions - establishes an historical context for describing how ecosystem elements have changed over time because of human influence and natural disturbances.
- Synthesis and Interpretation- compares current and reference conditions to determine long-term trends, and identifies the apparent causes of any significant differences between them.
- Recommendations - brings the five previous steps to a logical conclusion by recommending management treatments that are responsive to both ecosystem elements and the key issues and questions.

It would be preferable to study ecosystems undisturbed by humans as a way to characterize reference conditions, but that approach is virtually impossible in many situations (try to find a dry-site ecosystem unaffected by fire suppression anywhere in the western United States). Since undisturbed ecosystems are seldom available for study, historical information sources are used to infer what presettlement conditions were like. Unfortunately, the amount and quality of historical information can be highly variable.

Ideally, most of the information used to characterize reference conditions should come from historical sources. A wide variety of sources have been found to be useful, including reports, diaries and journals, photographs, maps, survey notes, newspaper articles, oral histories, tree ring chronologies, packrat middens, pollen samples from lake sediments, and aerial photographs. The objective of this document is to summarize 983 reference materials included in the history archives of the Umatilla National Forest silviculture library.

REFERENCE CONDITIONS: CONCEPTS AND TERMS

Reference conditions refer to a range of historical variability in ecological structures and processes, reflecting recent evolutionary history and the dynamic interplay of biotic and abiotic factors. They reflect ecosystem properties that are free of major influence by European-American humans, providing an insight into the characteristics of sustainable ecosystems (Kaufmann and others 1994). Reference conditions help us understand what an ecosystem is capable of, how natural disturbances operate, and how an ecosystem recovers after a perturbation (USDA Forest Service 1997a).

Reference conditions tend to become historic snapshots (literally and figuratively) but they are not intended to portray a static, unchanging condition. They should reflect ecological processes with important implications on ecosystem behavior, such as a capacity to function effectively in a constantly-changing environment. Western ecosystems evolved with a steady diet of fires, insect outbreaks, disease epidemics, floods, landslides, human uses, and weather cycles. Change was and still is the only constant in their existence. Restoring an ecosystem's resilience, its capacity for regeneration and renewal, is perhaps the most important contribution that reference condition information can offer to an assessment or planning effort.

The past can teach us what worked and what lasted – how healthy ecosystems sustained themselves through time. The historical range of variability (HRV) is a term used by ecologists to describe the fluctuation of ecosystem properties over time. As commonly used in the Inland Northwest, HRV refers to the range of conditions that occurred prior to settlement by Euro-Americans (generally defined as the mid-1800s). The type and frequency of presettlement disturbances can serve as a management template for maintaining sites within their historical range of plant communities and vegetation structures.

HRV is intended to serve as a benchmark from which change can be measured; it is not a specific condition that ecosystem management strives to attain (USDA Forest Service 1997). A common misconception is that

it might be appropriate to use HRV as a management objective by linking desired future conditions directly to HRV, but a better approach is to let historical data inform an analyst about ecosystem behavior and potential management consequences (Millar 1997). An ecosystem analysis should recognize that "ecosystems are moving targets, with multiple potential futures that are uncertain and unpredictable. Therefore management has to be flexible, adaptive, and experimental at scales compatible with the scales of critical ecosystem functions" (Walters 1986).

Even if land managers wished to "turn back the clock" to some golden presettlement era, the current reality of dams, roads, human settlements, fire suppression, and mounting demands on wildland resources to meet societal needs would make that goal problematic. A recent scientific assessment for the Interior Columbia River Basin suggests that presettlement conditions could not be restored even if that was an explicit objective (Quigley and Arbelbide 1997).

There are limitations associated with characterization of reference conditions and HRV in the Forest Service. Some important ones include a lack of funds and priority to do the job adequately; a lack of training about how to acquire, summarize, and interpret historical information; a lack or paucity of historical data for the time periods of interest; and the inability of current analytical tools to incorporate and utilize historical information at the scale needed (Millar 1997).

HISTORICAL REFERENCE MATERIALS

The Umatilla National Forest silviculture library includes an archives containing a variety of historical reference materials. It was initiated in 1993, primarily in response to three situations requiring access to historical information: (1) increasing emphasis on HRV as an analytical technique (Caraher and others 1992), (2) issuance of interim direction stipulating that HRV be used as an ecosystem 'screen' (USDA Forest Service 1995), and (3) implementation of "ecosystem analysis at the watershed scale" with its requirement to characterize vegetation reference conditions (Regional Ecosystem Office 1995).

Since the archives are intended to provide background information for characterization of vegetation reference conditions and HRV, many of the reference materials pertain to vegetation conditions. However, it also includes accessions about range management and livestock grazing, wildlife management, hydrology, and other natural resources. Note that the Umatilla National Forest has another archives administered by the Forest's archaeologist; it contains a variety of reference materials providing information about historic individuals, structures and facilities, policies, events, and so forth.

Whenever possible, historical reference materials are stored and used in accordance with direction from the Forest Service's "Guide to the curation of Forest Service administrative history archives and records" (West 1988). Documents and photographs are stored in acid-free folders labeled with the author's name and accession title or description. As required by Forest Service policy, materials are stored in locked file cabinets to ensure their security and to control access (West 1988). Some items are difficult to copy or distribute, so their use may need to be constrained to on-site access only (at the Supervisor's Office in Pendleton).

The archives contain materials pertaining to the entire Blue Mountains, not just the Umatilla National Forest portion. That decision was made because national forest boundaries changed over time (USDA Forest Service 1997b); much of the North Fork John Day Ranger District, for example, was included in the Whitman or Malheur National Forests at one time. With few exceptions, only items produced before 1950 are included in the history archives.

A computer program called ProCite is used to manage the historical accessions (it is also used for the main silviculture library, a collection of 5,000 items). All of the information in appendixes 1 and 2 was generated directly from the ProCite database. The following types of reference materials are available in the archives:

1. Aerial photographs - 38,687 prints covering 19,299 individual scenes (1937 through 1981).
2. Books and book chapters - 56 accessions.

3. Dissertations - 2 accessions.
4. General Land Office surveys - notes for 120 townships.
5. Government reports and records - 599 accessions.
6. Journal articles - 141 accessions.
7. Maps - 18 accessions.
8. Newspaper articles - 2 accessions.
9. Photographs - 161 accessions.
10. Conference proceedings and conference papers - 4 accessions.

In 1995, we decided to transcribe commonly-requested reports, primarily forest reserve establishment reports and silvics narratives produced before 1910, so that they could be distributed in an electronic format. Eventually, the transcribed documents will be available for downloading from the Umatilla National Forest's internet site (Table 1).[1] Limitations on time and funding have slowed the progress of that effort. The Forest would like to transcribe dozens of additional reports obtained from the National Archives (College Park, Maryland) in March of 1998, but time and funding limitations have prevented that work as well.

Appendix 1 provides an index of 983 reference materials available in the silviculture library history archives. It was generated from the ProCite database using the keywords field. Next to each index term (keyword) is a list of the accession numbers for which the keyword was used. Appendix 2 provides a summary for each historical accession in a standard bibliographic format (Forest Service ANSI), including an abstract, keywords and selected ancillary information (notes, size, etc.) when appropriate.

LITERATURE CITED

Caraher, D.L.; Henshaw, J.; Hall, F. [and others]. 1992. Restoring ecosystems in the Blue Mountains: a report to the Regional Forester and the Forest Supervisors of the Blue Mountain forests. Portland, OR: USDA Forest Service, Pacific Northwest Region. 14 p.

Kaufmann, M.R.; Graham, R.T., Boyce, D.A., Jr. [and others]. 1994. An ecological basis for ecosystem management. Gen. Tech. Rep. RM-246. Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. 22 p.

Millar, C.I. 1997. Comments on historical variation & desired condition as tools for terrestrial landscape analysis. In: Proceedings of the Sixth Biennial Watershed Management Conference. Water Resources Center Report No. 92. Davis, CA: University of California: 105-131.

Quigley, T.M.; Arbelbide, S.J., tech. eds. 1997. An assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins: volume 2. Gen. Tech. Rep. PNW-GTR-405. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 4 volumes: 337-1055.

Regional Ecosystem Office. 1995. Ecosystem analysis at the watershed scale. Version 2.2. Portland, OR: Regional Ecosystem Office. 26 p.

USDA Forest Service. 1995. Revised interim direction establishing riparian, ecosystem and wildlife standards for timber sales; Regional Forester's Forest Plan Amendment #2. Portland, OR: USDA Forest Service, Pacific Northwest Region. 14 p.

USDA Forest Service. 1997a. Considering all things: summary of the draft environmental impact statements. R6-P&EA-UP-007-97. [Place of publication unknown]: USDA Forest Service; USDI Bureau of Land Management. 57 p.

USDA Forest Service. 1997b. Establishment and modification of national forest boundaries and national grasslands; a chronological record: 1891-1996. FS-612. Washington, DC: USDA Forest Service, Lands Staff. 96 p (plus independently numbered index, exhibit, and addendums).

[1] Historical reports can be accessed at History Website

Walters, C.J. 1986. Adaptive management of renewable resources. New York, NY: McGraw Hill. 374 p.

West, T.L. 1988. Guide to the curation of Forest Service administrative history artifacts and records. Washington, DC: USDA Forest Service, Public Affairs Office, History Section. 61 p.

Table 1: Summary of transcribed reference materials from the history archives.

FILE NAME	EDIT?	REVISE?	WEB?	COMMENTS
1911Report1	No	No	No	1911 District Forester's Annual Report
1911Report2	No	No	No	1911 Report of Offices in District Office
Ames	No	No	No	1910 Timber Sales Talk at Supervisor's Meeting
Bartrum	No	No	No	1910 Fire Protection Talk at Supervisor's Meeting
BlueMtns1	Yes	Yes	No	1906 Report on Proposed Blue Mountains Forest Reserve
BlueMtns2	Yes	Yes	No	1908 Report on Silvics of Blue Mountain (E) National Forest
BlueMtns3	Yes	No	No	1906 Report on Proposed Addition to BM Forest Reserve
BlueMtns4	Yes	No	No	1906 Report on Blue Mountains Forest Reserve (E)
BlueMtns5	Yes	No	No	1906 Report on Blue Mountains (W) Reserve, Oregon
BlueMtns6	Yes	Yes	No	1903? Report on Blue Mountains Reserve (Gaskill)
Cascade	No	No	No	1907 Short Silvics report for Cascade (S) Forest Reserve
Cecil	No	No	No	1910 Outline used for Forest inspections
Chesnimnus1	No	No	No	1904 Proposed Chesnimnus Forest Reserve, Oregon
Chesnimnus2	No	No	No	1907 Report on Chesnimnus Forest Reserve, Oregon
Chesnirnnus3	No	No	No	1904 Supplemental Report on Proposed Chesnimnus Reserve
Colville1	No	No	No	Undated Report on Proposed Colville Forest Reserve, WA
Colville2	No	No	No	1910 Annual Silvical Report for Colville NF
Cutovers	No	No	No	1909 Memo about record-keeping for cut-over areas
Deschutes1	Yes	No	No	1910 Annual Silvical Report for Deschutes National Forest
Deschutes2	Yes	No	No	1913 Memo about lodgepole-covered pumice lands
Flory	No	No	No	1910 Organization of NF Force Talk at Supervisor's Meeting
Heppner1	Yes	Yes	No	1903 Proposed Heppner Forest Reserve, Oregon
Heppner2	Yes	Yes	No	1907 Report on Heppner, Oregon, National Forest
Idaho	No	No	No	1912 Annual Silvical Report, Idaho National Forest
Kummel	No	No	No	1910 Planting Talk at Supervisor's Meeting
La Grande	Yes	No	No	1903? Report on La Grande Forest Reserve (Gaskill)
Malheur	Yes	No	No	1911 Annual Silvical Report for Malheur National Forest
Munger	No	No	No	1910 Silvical Problems of the Northwest Report
Silvics1	No	No	No	1909 Annual Silvics Report for District VI
Silvics2	No	No	No	1911 Annual Silvics Report for District VI
Silvics3	No	No	No	1912 Annual Silvical Report for District VI
Umatilla1	Yes	Yes	No	1913 Report: Relative Merits of Western Larch & Douglas-fir
Umatilla2	Yes	No	No	1909 Umatilla National Forest Inspection Report
Umatilla3	Yes	No	No	1917 Extensive Grazing Reconnaissance of Umatilla NF
Umatilla4	No	No	No	1938 Analysis of Grande Ronde Working Circle
Umatilla5	No	No	No	1948 Pendleton/Pilot Rock WC Timber Disposal Plan
Umatilla6	No	No	No	1948 Timber Disposal Plan, La Grande WC, Elgin Block
Umatilla7	No	No	No	Undated Analysis of Dayton Working Circle, Umatilla NF
Umatilla8	No	No	No	1948 Heppner Working Circle Timber Disposal Plan
Urnatilla9	No	No	No	1939 Clearwater Working Circle Management Plan
Umatilla10	Yes	Yes	No	1910 Annual Grazing Report (Chidsey)
Wallowa1	Yes	No	No	1906 Report on Wallowa Forest Reserve, Oregon
Wallowa2	Yes	No	No	1904 Proposed Wallowa Forest Reserve, Oregon
Wallowa3	Yes	No	No	1903? Wallowa Reserve (Gaskill)
Wallowa4	Yes	No	No	1917 Report: The Forage Acre (Steffen)
Wallowa5	Yes	No	No	1907 Report: Grazing Lands By Life Zone (Pearson)

FILE NAME	EDIT?	REVISE?	WEB?	COMMENTS
Wallowa6	Yes	No	No	1907 Supplementary Report on Wallowa Forest Reserve
Wallowa7	No	No	No	1912 General Silvical Report for Wallowa!Minam Forests
Wenaha	Yes	Yes	No	1994 Extensive Reconnaissance of Wenaha NF in 1913
Wenaha1	Yes	No	No	1906 Report on Wenaha Forest Reserve
Wenaha2	Yes	No	No	1920 Timber Sale Report for Lookingglass Creek
Wenaha3	Yes	No	No	1906 Two short silvics reports for the Wenaha Reserve
Wenaha4	Yes	No	No	1906 Silvics Report for the Wenaha Forest Reserve
Wenaha5	Yes	No	No	1904 Proposed W enaha Forest Reserve
Wenaha6	Yes	No	No	1906 Examination of Proposed Addition to Wenaha FR
Whitman1	Yes	No	No	1911 Report: Regeneration Studies on Whitman NF in 1910
Wbitman2	Yes	No	No	1910 Report: Head Watershed, Middle Fork John Day River
Whitman3	No	No	No	1915 Report: Windfall Damage on Cut-over Areas

Sources/Notes: This table provides information about historical reports that have been transcribed (typed) so they can be distributed electronically. File name refers to the name of an electronic file for the document; all files exist in Word format at this point. "Edit?" refers to whether a transcribed version has been edited to find typing errors, format tables and figures, etc. "Revise?" refers to whether any proofreading edits have been made in the electronic file. "Web?" refers to whether an edited, revised version of the document has been converted to a portable document format (PDF) and loaded onto the Forest's internet site, thereby making it available for downloading and viewing using Adobe Acrobat Reader, a free internet file-viewing utility.

How can human communities manage landscape change that takes place over a hundred years or more, when people's perceptions and priorities change from generation to generation, or even from election to election? Humans may not have the right "attention span" to manage environmental change, and this may be the species' fatal flaw. Perhaps this is the value of history – as an attempt to extend the time frame of our memory beyond the human lifetime. The only problem is that history represents selective memory.

Anne Whiston Spirn, *Constructing nature: the legacy of Frederick Law Olmstead*
In: Uncommon Ground, William Cronon, editor, 1996 (Norton, New York)

APPENDIX 1: INDEX OF REFERENCE MATERIALS

This appendix provides an index for 983 reference materials available in the history archives of the Umatilla National Forest silviculture library. A computer program called ProCite is used to catalogue and manage the historical accessions. This index was derived from ProCite by generating a subject bibliography based on the keyword field. Next to each index term (keyword) is a list of the accession numbers for which the keyword was used. If a user was interested in historical information about acephate, for example, they would consult the bibliographic summary and abstract (see appendix 2) for items number 303 and 305.

ABA x TBA stand index factor 731

Access management 129, 315, 737, 775

Acephate 303, 305

Aerial photography 39, 483, 721, 754

Aerial spraying 339, 962

Agriculture 17, 130, 179, 180, 220, 292, 348, 360, 429, 684, 792, 889, 890, 891, 892, 897, 905

Air drifts 314

Alaska 127, 296, 793

Alaska yellow cedar 473

Alberta 43

Alder Creek 102

Aldrich Mountains 290

Alkali Canyon 180

Alpine larch 281

Alpine zone 171, 318, 643, 662

American holly 162

American Indians 21, 153, 268, 368, 834, 893

Animal damage control 165, 181, 226, 680, 699

Anthony Lakes 273, 553

Appalachia 724

Arbor Day 789

Arborculture 515

Arbuckle Mountain 2

Arceuthobium campylopodum 377

Arceuthobium laricis 944

Arizona 317, 566, 569, 570, 571, 773, 970

Artemisia tridentata 634

Artificial regeneration 165, 168, 181, 372, 381, 382, 383, 410, 452, 477, 571, 680, 730, 742, 762, 763, 764, 765, 780, 823, 836, 837, 838, 839, 852, 864, 881, 922, 972

Asotin County WA 49, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 357, 775, 913

Asotin Creek 63, 81, 179

Asotin RD 440

Avalanches 318

Bacillus thuringiensis 54, 304, 339, 788, 797, 799, 860

Baker County OR 47, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130, 379

Bally Spring 603

Bark beetles 26, 100, 101, 167, 191, 224, 299, 300, 301, 350, 351, 352, 353, 474, 576, 577, 578, 706, 709, 811, 824, 835, 883, 938, 960, 983

Bark-thickness factors 711

Basal area 769

Battle Mountain 99

Bear Valley RD 60

Bear Wallow Creek 590

Beaver 149, 166, 405, 406

Beaver Creek 22

Beaver dam 405

Beaver damage 406

Benzene 962

Big Cottonwood Canyon 22

Big game 149, 330, 331, 333, 334, 335, 407, 551, 641, 772

Big Pine Creek ID 373

Big trees 644

Bingham Springs 75, 76

Bitterbrush 22, 611, 612

Bitterroot NF 959

Black cottonwood 75, 76, 131, 202, 277, 281, 473, 627, 967

Black Hills beetle 167

Black locust 384, 449, 836, 837, 885

Black walnut 96, 447, 837

Blackfeet NF 430

Blacks Mountain Experimental Forest 272

Blue Mountains 3, 8, 9, 10, 11, 15, 26, 51, 54, 58, 59, 60, 61, 90, 91, 99, 136, 140, 141, 152, 184, 185, 190, 194, 196, 197, 198, 199, 201, 202, 214, 215, 219, 225, 232, 233, 234, 238, 241, 257, 258, 259, 261, 276, 283, 296, 301, 302, 303, 304, 305, 310, 316, 344, 345, 362, 367, 379, 382, 383, 390, 391, 392, 394, 401, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 440, 455, 456, 457, 458, 459, 460, 461, 462, 469, 473, 484, 510, 519, 522, 530, 542, 544, 545, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 567, 575, 576, 577, 578, 617, 618, 619, 627, 628, 631, 656, 657, 665, 670, 671, 679, 704, 706, 707, 709, 720, 723, 725, 726, 728, 733, 734, 757, 770, 775, 790, 797, 799, 824, 834, 840, 860, 861, 883, 884, 925, 936, 937, 941, 944, 945, 949, 950, 951, 952, 954, 961

Blue Mountains Forest Reserve 42, 194, 195, 232, 391, 394, 639, 954

Blue Mountains NF 194, 195, 214, 437, 707

Boardman OR 885

Bobsled Creek 84
Boise NF 838, 839
Bonanza Basin 411
Bone Springs Mountain 599
Botany 1, 37, 135, 145, 148, 177, 287, 347, 575, 703, 760, 916, 975
Boundary wildfire 588
Bourne OR 415, 423
Bowman-Hicks Lumber Company 733
Box elder 374, 836, 837
Bristlecone pine 30, 231, 566
Broadcast burning 520, 534
Broadcast seeding 181, 852
Brock Meadows 69
Browse 330
Brush clearing 53, 309
Buckthorne 967
Buffaloberry 22
Bull Prairie Ranger Station 188
Bunchgrass ranges 702, 912
Burnt River 179, 258, 455
Butte Creek 79, 616
Butter Creek fire 5 81
Cable Cove 412, 414
Cache NF 22
California 52, 127, 153, 154, 186, 365, 687, 688, 691, 693, 724, 793, 921
Camas Creek 101, 102, 457, 734, 840, 842
Canopy cover 178, 738
Canyon City OR 413
Caraway homestead 65
Carbaryl 54, 303, 304, 305, 860
Carolina poplar 384
Carpentier Creek ID 373
Cartographic data 14, 356, 541
Cascade Mountains 1, 274, 547, 575
Cascade NF 363, 526, 527
Cascade Range Forest Reserve 160, 394
Cascade (S) NF 364
Cattle and calves 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130

Cattle grazing 7, 27, 28, 136, 184, 302, 307, 319, 507, 537, 618, 627, 633, 638, 659, 663, 667, 677, 702, 736, 849

Ceanothus 22

Census summaries 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130

Central Idaho 370, 373, 936

Central Oregon 1, 184, 468

Central Rocky Mountains 30, 32, 231, 722, 963

Challis NF 845

Charles Darwin 727

Chelan County WA 46

Chelan NF 46, 56

Chemical insecticides 54, 103, 303, 304, 305, 339, 544, 788, 797, 799, 845, 860, 861, 880, 961, 962

Cherry 967

Chesnimnus Forest Reserve 140, 196, 392, 394

Chokecherry 22, 374

Christmas holly 162

Clackamas County OR 18, 779

Clallam County WA 712

Clark County WA 485

Clarke County WA 18, 779

Cleanings 732

Clearcutting 247, 343, 430, 533, 620, 825, 940

Clearwater Ranger Station 894, 902, 903, 906, 911

Clearwater River 179

Clearwater Working Circle 440, 787, 869

Clematis 22

Climate 6, 22, 33, 192, 227, 230, 273, 274, 275, 349, 366, 397, 635

Climax vegetation 43, 155, 753, 964

Coastal Douglas-fir 181, 297, 533

Coeur d'Alene NF 431

Colorado 30, 32, 146, 404, 643, 684, 702, 703, 722, 963

Columbia basin 654, 807

Columbia County WA 49, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 218, 357, 675, 775, 890, 891, 892, 914

Columbia NF 106, 433

Columbia River 179, 180, 270, 917

Colville Forest Reserve 19

Colville Indian Reservation 38, 56, 104

Colville NF 19, 56, 104, 281

Colville Reservation 435, 930, 934
Commercial thinning 971
Common juniper 967
Community development 12, 164, 169, 235, 252, 253, 254, 256, 261, 361, 385, 789, 807, 889
Condon Working Circle 456
Cone collection 126, 204, 381, 765
Cone insects 476
Cone serotiny 123, 146
Cones 126, 568
Congo Gulch 596
Conifer trees 762
Conversion factors 536
Coppice cutting 247
Cordwood 262, 774
Corkbark fir 566
Cornucopia 411, 421, 424
Corporation Ranger Station 75, 76, 837
Cottonwoods 750
Cowlitz County WA 18, 433, 779
Cowlitz River 180
Crater Lake National Park 492
Crater NF 521, 957
Crawfish Creek 553
Crawfish Lake 553
Cronartium pyriforme 282
Crook County OR 524, 526, 527
Crooked Fork 80
Crown classes 865
Crown closure 178, 738, 865
Crown Point mine 412
Currant 22, 374
Cutover areas 5, 276, 370, 430, 431, 521, 557, 558, 723, 725, 726, 825, 826, 940, 950, 951, 952, 957, 958
Cypresses 741
Damage appraisal 251
David Douglas 975
Dayton Block 15
Dayton WA 597
Dayton Working Circle 15

DDT 36, 99, 103, 190, 225, 239, 316, 339, 544, 720, 757, 788, 797, 799, 845, 860, 861, 961, 962
Deadwood River ID 373
Death camas 442
Decays 428, 467, 525, 948
Deer 331, 333, 772
Deerhorn Creek 102, 224
Deerlodge NF 943
Deforestation 192, 429, 546
Dendroctonus 26, 100, 101, 191, 299, 301, 474, 576, 577, 578, 706, 709, 824, 835, 883, 960, 983
Dendrology 277, 448, 676
Density management 731
Deschutes NF 42, 131, 168, 195, 468, 489, 492, 493, 513, 524, 526, 527, 532, 957
Deschutes River 180
Deschutes River Valley 1
Desolation Creek 99
Diameter growth 58, 276, 434, 521
Diameter-growth equations 711
Direct seeding 31, 165, 381, 383, 680, 765, 864
Disease control 443, 472, 946
Disease surveys 472, 791, 846, 943
Distillation 183
Ditch Creek 925
Dixie Meadows Mining Company 884
Dixon Guard Station 2, 101, 102, 224
Douglas-fir 35, 39, 90, 95, 131, 202, 211, 214, 222, 277, 281, 283, 298, 369, 378, 463, 473, 523, 574, 723, 748, 759, 778, 819, 831, 922, 967, 971
Douglas-fir beetle 35, 102, 167, 299, 351, 578, 811
Douglas-fir pitch moth 95, 351
Douglas-fir tussock moth 36, 99, 102, 103, 238, 339, 510, 544, 788, 797, 799, 846, 860
Douglas hawthorne 967
Dredge tailings 288
Dry Fork Clear Creek 10
Dry Gulch Ranger Station 837, 895
Ducks 409, 771
Dunning vigor classification 353
Dwarf mistletoes 123, 377, 707, 945, 947
Eagle Cap Wilderness 417, 418
Eagle Creek 417, 418

East Oregon Lumber Company 200

Eastern Montana 880

Eastern Oregon 12, 13, 47, 48, 55, 57, 58, 124, 164, 167, 172, 184, 235, 237, 260, 349, 352, 368, 379, 439, 470, 479, 488, 503, 513, 520, 532, 534, 537, 564, 575, 577, 619, 647, 648, 651, 675, 710, 816, 827, 828, 893, 939, 940, 950, 951, 952, 958, 966

Eastern Washington 38, 55, 164, 260, 275, 470, 532, 534, 547, 647, 648, 816, 939, 940, 958

Ecology 156, 157, 158, 683, 727

Economics 174, 205, 271

Eden Bench 67

Edmiston Spring 909

Elderberry 374

Elgin Block 344

Elk 85, 86, 149, 331, 333, 772

Elk Flat 77

Elkhorn Mountains 412, 414

Emigration 893

Engelmann spruce 30, 31, 131, 202, 210, 211, 213, 214, 231, 273, 277, 281, 295, 374, 430, 473, 553, 560, 561, 566, 571, 597, 598, 655, 680, 711, 751, 778, 818, 819, 820, 821, 967

English holly 162

Ensign Creek 603, 705, 708

Ephraim Canyon 22, 24, 318, 978

Ernst Haeckel 727

Erosion control 265, 318, 384, 449, 885, 886, 916

Esquatzel Coulee 179

Ethnography 509

Euro-American settlement 893

European forestry 44, 205, 207, 681, 981

Even-aged stands 471

Exotic species 633, 836, 837

Explorer journals 124, 172, 368, 547, 651, 918, 966, 974, 975

False hellebore 605

Farm forests 34, 53, 96, 97, 162, 360, 446, 449, 451, 452, 453, 454, 761, 762, 763, 808, 877, 878

Fence posts 969

Ferry County WA 104

Fertilization 873

Festuca viridula 665

Fifteenmile Creek 180

Fir engraver 102, 351, 739, 811

Fire control 132, 137, 150, 242, 248, 278, 361, 539, 579, 631, 687, 689, 690, 692, 694, 697, 806, 809, 939, 965

Fire damage 251, 581

Fire danger 279, 631

Fire detection 631, 692, 694

Fire ecology 43, 70, 150, 166, 211, 231, 273, 571, 623, 635, 722, 724, 930, 931, 932, 933, 934

Fire effects 31, 61, 68, 73, 74, 91, 146, 151, 154, 160, 211, 231, 259, 283, 286, 365, 435, 444, 468, 474, 530, 539, 581, 623, 687, 689, 691, 693, 722, 724, 904, 921, 930, 931, 932, 933, 934, 965

Fire fighting 132, 137, 248, 354, 539, 631, 806, 908, 965

Fire history 18, 146, 307, 623, 834, 965

Fire lookouts 631, 694

Fire prevention 132, 137, 150, 278, 533, 539, 579, 631, 694, 697, 700, 806, 809, 914, 957, 958, 965

Fire weather 242, 279, 631

Fivemile Creek 101, 102

Flood control 179, 180, 890, 891, 892

Floods 179, 180, 307, 890, 891, 892

Floral greens 162

Fly Creek 705

Foothills zone 171, 395, 566, 643, 662

Forage production 327, 328

Forage utilization standards 617, 618

Forbs 177, 287, 327, 328, 336, 337, 338

Forest administration 45, 311, 354, 380, 393, 402, 646, 848

Forest ecology 22, 24, 25, 30, 31, 33, 43, 44, 70, 78, 81, 82, 83, 84, 123, 155, 231, 240, 241, 243, 244, 273, 283, 370, 373, 376, 395, 396, 397, 430, 432, 469, 523, 566, 567, 575, 685, 722, 753, 770, 927, 956, 963, 978, 980, 981

Forest economics 208, 311, 378, 431, 532, 548, 726

Forest fires 18, 29, 68, 132, 137, 150, 166, 228, 229, 231, 242, 251, 279, 286, 435, 506, 539, 579, 580, 581, 629, 630, 631, 687, 690, 691, 692, 694, 697, 700, 722, 758, 775, 779, 806, 809, 810, 834, 904, 965

Forest flammability 242, 631

Forest history 4, 12, 14, 16, 28, 29, 42, 44, 50, 61, 91, 160, 168, 169, 205, 207, 221, 240, 248, 261, 284, 311, 313, 343, 346, 356, 360, 379, 380, 385, 394, 437, 480, 508, 509, 538, 546, 547, 549, 550, 564, 573, 574, 621, 622, 624, 625, 626, 636, 639, 642, 645, 658, 674, 675, 678, 681, 686, 773, 775, 822, 887, 968, 975

Forest influences 6, 22, 24, 30, 33, 163, 192, 227, 230, 317, 366, 374, 395, 396, 397, 399, 430, 432, 464, 478, 635, 640

Forest inventory 10, 11, 14, 38, 40, 46, 47, 48, 49, 55, 56, 60, 89, 98, 104, 105, 106, 107, 108, 109, 110, 111, 138, 152, 156, 157, 158, 164, 175, 201, 205, 228, 229, 235, 236, 237, 246, 249, 250, 257, 258, 259, 324, 340, 341, 342, 356, 357, 358, 400, 426, 433, 438, 439, 455, 456, 457, 458, 459, 460, 461, 462, 465, 479, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 637, 653, 672, 673, 683, 712, 713, 714, 715, 716, 717, 721, 738, 758, 769, 776, 777, 790, 794, 795, 796, 802, 803, 804, 805, 807, 812, 816, 817, 827, 828, 830, 842, 843, 847, 851, 857, 859, 862, 866, 867, 875, 925, 979

Forest management 15, 19, 23, 25, 28, 33, 58, 61, 91, 133, 134, 141, 154, 168, 193, 198, 205, 206, 210, 234, 240, 241, 252, 253, 254, 256, 272, 283, 284, 306, 310, 311, 344, 345, 362, 364, 369, 370, 373, 390, 391, 392, 403, 404, 430, 440, 445, 451, 452, 466, 469, 478, 511, 513, 514, 516, 517, 518, 528, 543, 549, 563, 570, 573, 574, 620, 645, 655, 658, 679, 688, 737, 759, 761, 770, 775, 808, 815, 818, 819, 820, 821, 822, 825, 826, 829, 831, 832, 833, 863, 866, 868, 873, 939, 940, 942, 951, 952, 954, 959, 970

Forest mapping 39, 138, 164, 175, 228, 250, 396, 397, 508, 541, 637, 653, 682, 695, 721, 758, 816, 817, 827, 828, 851, 866, 867, 875, 956, 979

Forest measurements 40, 94, 175, 178, 249, 649, 721, 738, 769, 794, 795, 796, 802, 803, 804, 805, 812, 847, 859, 862, 866, 976, 977

Forest organization 45, 133, 134, 212, 646, 806

Forest policy 133, 134, 169, 205, 247, 311, 313, 343, 480, 546, 548, 549, 621, 622, 658, 674, 887, 932

Forest Products Laboratory 814

Forest regulation 133, 134, 272, 532, 649, 737

Forest reserves 16, 161, 313, 385, 393, 394, 402, 508, 537, 538, 632, 642, 652, 659, 681, 926, 968

Forest roads 896

Forest staffing 212, 354, 535

Forest types 8, 9, 30, 39, 72, 73, 74, 79, 213, 214, 283, 324, 340, 341, 342, 355, 359, 396, 401, 448, 566, 572, 637, 653, 670, 671, 685, 690, 695, 816, 817, 830, 924, 925, 967, 979, 981

Forestry education 311, 454

Forestry extension information 45, 53, 96, 97, 451, 452, 454, 646, 761, 762, 763, 783, 789, 807, 808, 809, 877, 878

Forestry terminology 781

Fort Valley Experiment Station 317, 571

Frazier Guard Station 602

Frederic Clements 147, 155, 964

Frederick Olmsted 543

Fremont Experimental Forest 655

Fremont Historic District 595, 596, 601

Fremont NF 168, 363, 492, 493, 520, 526, 527

Fremont power house 595, 596, 600, 601

Front Range CO 31, 33, 231, 655, 702, 963

Frost damage 374, 949

Frost pockets 314

Frost rings 650

Fruit growing 17

Fry Meadows 69

Fuelwood 263, 774, 887

Fur trapping 172, 651, 771, 918, 966

Gambel oak 22, 374

Game refuges 409, 551, 771, 772

Garfield County WA 49, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 357, 775, 894

General Land Office 182, 652, 659, 682, 735

Genetics 41, 371

Geology 163, 193, 417, 418, 425

George McClellan 547

Gifford Pinchot 16, 550, 620, 636, 968

Gifford Pinchot NF 168, 495

Gilbert Creek 609

Glacier Peak Limited Area 438

Glades 87, 88

GLO survey notes 50, 156, 157, 158, 182, 682, 683, 735

Godman Springs 597

Godman Springs Ranger Station 900

Golconda mine 415

Gold mining 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425

Grand fir 131, 202, 210, 211, 214, 281, 283, 431, 473, 556, 561, 562, 574, 614, 751

La Grande Forest Reserve 233

La Grande RD 457, 459, 587, 589, 767, 768

Grande Ronde River 71, 179, 834

Grande Ronde Working Circle 310, 787, 869

La Grande Working Circle 344, 787, 869, 872, 882

Granite OR 412, 414, 419

Grant County OR 12, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130, 184, 261, 270, 379, 400, 479, 675, 953

Grant OR 270

Grasses 135, 176, 265, 327, 328, 336, 337, 338, 729

Grassland 613

Grays Harbor County 486

Grays River 500

Grazing 7, 136, 159, 184, 260, 278, 307, 375, 427, 441, 442, 481, 507, 537, 540, 632, 638, 659, 665, 666, 667, 669, 677, 736, 849

Grazing damage 2, 28, 136, 159, 161, 293, 318, 325, 326, 329, 330, 331, 332, 333, 334, 335, 375, 540, 583, 584, 585, 586, 588, 592, 593, 594, 603, 617, 633, 665, 667, 718, 736, 849, 906

Great Basin 159, 260, 348

Great Basin Range Experiment Station 24, 467, 849

Great Plains 684, 877, 878

Green fescue 560, 617

Greenhorn Mountain 560, 561

Growth rings 349

Hardwood trees 96, 763
Harney County OR 261, 487, 488
Height growth 58, 321
Hemlock looper 339
Hemlocks 211, 748
Henry Creek 383, 839
Heppner Forest Reserve 387, 388, 389, 390, 394
Heppner NF 197, 437
Heppner RD 2, 36, 101, 188, 190, 224, 225, 312, 316, 383, 387, 388, 389, 456, 519, 520, 609, 610, 611, 612, 613, 614, 615, 720, 757, 835, 836, 838, 839, 924, 925, 953
Heppner Working Circle 563, 787, 869
Herbicides 309
Herron Ranger Station 2
Hexachloride 962
Historical preservation 189
Hixson Gulch 897, 905
Home construction 271, 323
Homestead 598, 767, 768
Honey locust 836, 837
Honeysuckle 22
Hood River 180, 236
Hood River County OR 236
Horse grazing 302, 307, 907, 908, 909, 910, 913
Horse packing 607
Horses 268
Horses and mules 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130
House paints 92, 93
Hudson Bay Company 172, 651, 966
Human disease 153
Hunting 409
Hydraulic mining 555, 559
Idaho 404, 628, 650, 718, 935, 937
Idaho Creek 11
Idaho NF 967
Imnaha River 179
Improvement cuttings 25, 247, 725, 732
Incense cedar 277, 748
Indian Lake 708

Indicator plants 22, 176, 376, 444, 666, 684, 978, 981

Inferior tree species 258, 283, 431, 725, 726, 829

Inland Empire 174, 267, 322, 369

Insect control 26, 36, 54, 99, 103, 167, 190, 191, 203, 225, 238, 239, 299, 300, 301, 303, 304, 305, 339, 351, 361, 367, 449, 510, 544, 545, 577, 578, 706, 709, 788, 797, 799, 811, 824, 835, 845, 860, 861, 880, 883, 938, 961, 962, 983

Insect damage 26, 35, 36, 54, 95, 99, 100, 101, 102, 103, 167, 190, 191, 201, 223, 224, 225, 238, 299, 300, 301, 303, 304, 305, 316, 339, 351, 367, 449, 474, 510, 528, 544, 545, 565, 576, 577, 578, 706, 709, 720, 739, 757, 788, 797, 799, 811, 835, 845, 860, 861, 880, 883, 938, 960, 961, 962, 983

Insect prevention 300, 938, 957, 958

Insect surveys 545, 846

Insect susceptibility 224, 350, 352, 353

Insects 203, 299, 351, 577, 739, 778, 811, 846

Intermountain region 372, 760

International forestry 240

Iron Springs Ranger Station 837, 899, 907

Isaac Stevens 21, 547

Island County WA 715

James Clyman 124

Jefferson County OR 489

Jefferson County WA 713

Jeffrey pine 167, 272

Jeffrey pine beetle 167

Joel Palmer 21

John Day OR 290, 416, 422

John Day River 12, 180, 184, 290, 416, 422, 460, 855, 917

John Day Valley 290

John Drake 368

John Fremont 13

Junipers 159, 741

Kahler Creek 102, 383, 838

Kaniksu NF 204, 431

Keen classification system 57, 224, 352, 353

King County WA 105, 714

Kinzua Lumber Company 190, 316, 720, 757, 842

Kitsap County WA 490, 715

Kittitas County W A 491

Klamath County OR 492, 524, 526, 527

Klamath Indian Reservation 492, 520, 532, 565

Klickitat County W A 106
Klickitat River 180
Klondike Ridge 582
Lake County OR 493
Land classification 138, 250, 566, 572, 637, 653, 827, 828, 851, 858, 875, 979
Land clearing 53
Land stewardship 375, 429
Land surveying 175, 182, 735
Land use planning 179, 180, 429, 674, 867, 889, 890, 891, 892, 919
Landslides 318
Lane County OR 494
Larch dwarf mistletoe 201, 241, 578, 726, 832, 944
Larches 748
Leaf crops 162
Legumes 265
Lewis County WA 495
Lewis River 180, 485
Lick Creek 959
Liebig's law of minimum 755
Lightning 506, 630
Lightning-caused fires 506
Limb rust 282
Limber pine 30, 31, 231, 566, 655, 967
Lincoln County OR 496
Linn County OR 465
Little Wall Creek 610
Little White Salmon River 180
Livestock damage 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 838, 839
Livestock diseases 28
Livestock feeds 507
Livestock forage 7, 176, 177, 287, 507, 638, 647, 667, 669, 677, 729, 736, 849
Livestock grazing 2, 70, 255, 729
Locust borer 449
Lodgepole pine 26, 30, 123, 131, 146, 191, 201, 202, 210, 211, 214, 273, 274, 275, 277, 281, 282, 283, 301, 321, 363, 374, 403, 405, 406, 444, 445, 469, 473, 478, 512, 524, 526, 527, 554, 555, 556, 559, 574, 576, 577, 578, 587, 590, 598, 706, 709, 711, 722, 723, 749, 759, 769, 770, 778, 790, 818, 819, 820, 821, 824, 835, 863, 883, 894, 902, 903, 967, 976, 983
Log construction 209
Log structures 209

Logging chances 201
Logging equipment 581
Logging operations 759
Logging residue 183, 398, 520, 534, 957, 958
Lonerock Driveway 187
Long Creek RD 10, 461, 462
Longleaf pine 800
Lookingglass Creek 185, 519
Lookout Creek 589
Lookout Mountain 588, 589
Lop-and-scatter slash treatment 520
Lumber grades 752
Lumber production 12, 217, 252, 253, 254, 256, 261, 271, 379, 888
Madison NF 123
Malathion 880
Malheur County OR 47
Malheur NF 10, 11, 42, 47, 54, 58, 60, 128, 195, 214, 239, 245, 246, 290, 291, 303, 304, 305, 340, 383, 391, 400, 413, 416, 420, 422, 460, 461, 462, 473, 479, 487, 488, 509, 513, 519, 532, 553, 558, 577, 631, 790, 801, 835, 842, 855, 861, 874, 883, 884, 952, 954, 961
Malheur River 460
Malheur Working Circle 340
Manitou Experimental Forest 702
Manti NF 22, 24, 663, 668
Manzanita 22
Maple sugar 97
Maple syrup 97
Maps 8, 9, 14, 255, 355, 356, 359, 541, 670, 675, 685, 698, 740, 782, 924, 929
Marcus Whitman 51
Marion County OR 505
Mason County WA 497
Master Sample Grid 40
Maturity selection system 276, 521, 529, 531, 940
McAllister Creek 484
McKay Creek 744, 745, 746, 747
Meacham Creek 62, 82
Meacham OR 774
Meadow Creek 99, 587
Meadows 77, 87, 88
Medicinal plants 696

Mexacarbate 54, 304

Michigan 50

Middle Fork John Day River 461, 462

Migratory waterfowl 409, 771

Mill Creek 307, 325, 329, 330, 331

Milton Box Company 840

Milton OR 17

Minam NF 191, 202, 259, 383, 577, 790, 874, 951, 952

Mining damage 318

Mining towns 425

Mink Creek 22

Mixed-conifer forest 580, 581, 589, 596, 599, 600, 601, 608, 609, 611, 767, 768

Mole control 699

Montana 404, 637, 650, 653, 680, 832, 943

Montane zone 171, 395, 566, 643, 662

Morrow County OR 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 237, 387, 388, 389, 564, 634, 672

Morrow Working Circle 870, 871

Mortality 928

Mottet Valley 599

Mount Hood 270

Mount Mazama 274

Mount Rainier National Park 108, 495

Mountain ash 374, 967

Mountain climate 32, 279, 314, 396, 397, 432, 963

Mountain hemlock 202

Mountain mahogany 583, 585, 586, 592, 593, 594, 612, 967

Mountain meadows 143, 159, 405, 406, 553, 587, 597, 598, 602, 603, 605, 606, 619, 648, 656, 657

Mountain pine beetle 26, 167, 191, 201, 203, 224, 238, 299, 301, 350, 351, 367, 576, 577, 578, 706, 709, 811, 824, 835, 846, 883, 983

Mt. Baker NF 438, 499, 716

Mt. Emily Lumber Company 457, 734, 840, 842

Mt. Hood NF 168, 236, 358, 498, 505, 545, 720, 757

Mud-Davis Creek timber sale 200

Mud Spring 909

Mule’s ears 602

Multiple use management 193, 269, 361, 729, 879, 889

Multnomah County OR 498

Nathaniel Wyeth 974

National Archives 14, 356, 550, 624, 625, 626, 636, 754, 854

National Forest Management Act 343

National forests 45, 221, 375, 538, 642, 773, 848

Native Americans 21, 361

Natural regeneration 24, 25, 59, 70, 78, 81, 82, 83, 84, 146, 210, 231, 297, 298, 370, 373, 430, 477, 523, 569, 571, 655, 722, 825, 826, 838, 839, 940, 950, 951, 952

Naval stores 800

Nevada 260, 760

New Mexico 376, 569, 570, 773, 970

Ninebark 22

Nisqually Indian Reservation 110

North America 676

North Cascade Primitive Area 38, 438

North Fork Burnt River 201

North Fork John Day RD 101, 312, 457, 459, 462, 580, 582, 583, 584, 585, 586, 588, 589, 590, 591, 592, 593, 594, 595, 596, 601, 602, 608, 609, 734, 806, 835, 840, 841

North Fork John Day River 288, 555, 559, 600, 953

North Fork John Day Wilderness 553

North Fork Nooksack Natural Area 438

North Fork Working Circle 870, 871

North Pole mine 423

North slope type 283

North Umatilla Working Circle 785, 786, 868, 870, 871

Northeastern Oregon 8, 12, 26, 42, 191, 239, 273, 301, 577, 578, 617, 618, 634, 664, 665, 670, 671, 675, 706, 709, 834, 835, 883, 983

Northeastern United States 724, 956

Northeastern Washington 19, 174, 266, 267, 281, 369, 404, 435, 680, 930, 934

Northern California 260, 272, 689, 690, 692

Northern Idaho 18, 151, 174, 204, 210, 266, 267, 369, 395, 398, 431, 637, 653, 680, 719, 928

Northern Region 832, 946

Northern Rocky Mountains 123, 167, 171, 211, 395, 396, 397, 430, 724

Northwestern Montana 174, 266, 267, 403, 430, 959

Northwestern Oregon 18, 779

Northwestern Washington 369

Nurse crop 571

Nursery practices 292, 372, 730, 742, 762, 763, 764, 765, 823, 972

Ochoco NF 42, 58, 131, 195, 246, 304, 305, 400, 479, 487, 488, 502, 503, 577, 952, 961

Okanogan County WA 38, 56, 799

Okanogan NF 38, 795

Old trees 644

Olympic National Park 486, 497

Olympic NF 181, 486, 497

Oneseed juniper 566

Oregon 20, 52, 125, 127, 228, 296, 298, 315, 401, 427, 481, 506, 512, 516, 517, 518, 522, 530, 573, 574, 686, 758, 788, 793, 798, 853, 917

Oregon Coast Range 661

Oregon history 13, 21, 153, 315, 368, 475, 564, 893, 918, 919, 973, 974

Oregon Lumber Company 461, 462

Oregon Trail 124, 475, 564, 893

Pachistima 22, 374

Pacific County WA 107

Pacific Northwest 4, 29, 250, 265, 277, 298, 320, 346, 385, 463, 470, 514, 534, 547, 642, 724, 743, 807, 817, 939, 945, 947, 971, 975

Pacific Northwest history 268

Pacific Northwest Region 16, 40, 89, 98, 125, 212, 246, 296, 347, 437, 506, 642, 700, 737, 790, 791, 796, 798, 801, 802, 803, 804, 805, 810, 811, 812, 830, 842, 852, 853, 858, 859, 862, 864, 867, 873

Pacific ponderosa pine 371

Pacific Railroad Surveys 1, 547

Pacific yew 202, 281, 473, 748

Paleobotany 273, 274, 275

Palmer Junction 71

Palouse prairies 936

Palouse River 179

Pandora moth 351, 565, 811

Paradise Ridge 325, 330

Parallax wedge 483

Partial cutting 186, 654

Pathological rotation 466

Patit Creek experimental plot 332, 336, 337, 338

Paulina NF 524, 526, 527, 577

Payette NF 151, 370, 373, 718

Pearson Creek 582

Pendleton-Pilot Rock Working Circle 345, 787, 869, 872, 882

Pendleton RD 324, 787, 872, 882

Penland Prairie 312

Penta 969

Pentachlorophenol 969

Peter Ogden 172, 651, 966

Phillips Creek 99

Photography 189, 550, 636, 813

Pierce County WA 108

Pignut hickory 837

Pike and San Isabel NF 33, 963

Pikes Peak 31, 33, 231, 655, 963

Pile burning 534

Pine-bunchgrass rangelands 618

Pinegrass-elk sedge rangelands 618

Pines 749

Pinyon pine 566

Pioneer journals 475

Placer mining 555, 559

Plains zone 171, 643, 662

Plant associations 244, 395, 634

Plant communities 22, 155, 269, 464, 575, 753, 760, 964

Plant ecology 33, 155, 171, 265, 269, 464, 566, 634, 643, 662, 753, 755, 760, 927, 936, 964

Plant identification 37, 135, 145, 148, 176, 177, 287, 628, 647, 664, 686, 696, 703, 741 , 743, 748, 749, 750, 751, 760, 791, 916

Plant succession 22, 25, 30, 31, 33, 43, 147, 155, 159, 231, 243, 244, 273, 274, 275, 396, 397, 464, 523, 556, 571, 617, 666, 722, 753, 927, 935, 937, 956, 964, 981

Plantation protection 410, 477, 852, 922

Planting 206, 477, 852

Poisonous plants 28, 176, 347, 441, 442, 667, 736

Polk County OR 109

Pollen analysis 273, 274, 275

Pomeroy RD 42, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73, 74, 78, 79, 80, 81, 83, 170, 213, 216, 217, 218, 220, 262, 324, 380, 597, 598, 607, 616, 782, 837, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914

Ponderosa pine 12, 22, 24, 26, 30, 31, 33, 52, 55, 57, 58, 59, 67, 81, 100, 101, 131, 139, 151, 154, 167, 183, 191, 201, 202, 210, 211, 214, 261, 272, 273, 275, 276, 277, 281, 282, 283, 286, 293, 301, 350, 352, 353, 363, 370, 371, 373, 374, 377, 378, 383, 384, 410, 428, 434, 435, 468, 470, 471, 473, 474, 476, 511, 514, 519, 520, 521, 522, 524, 526, 527, 529, 530, 531, 532, 534, 552, 557, 558, 562, 565, 566, 568, 569, 570, 574, 576, 577, 578, 581, 582, 583, 584, 585, 586, 587, 588, 591, 592, 593, 594, 602, 608, 609, 610, 613, 614, 615, 627, 654, 655, 680, 688, 691, 693, 702, 704, 706, 709, 710, 711, 718, 723, 725, 726, 749, 778, 819, 820, 821, 824, 829, 833, 835, 881, 883, 901, 907, 921, 939, 940, 941, 957, 958, 959, 960, 967, 970, 977, 983

Ponderosa Way 309

Poplars 750, 885

Porcupines 226

Potamus Creek 609, 925

Powder River 179, 259

Powwatka Ridge 152, 484, 733

Prairie City OR 290, 416, 420, 422

Precipitation 227, 230, 478, 635

Precommercial thinnings 511, 512, 514, 873

Prescribed burning 930, 931, 932, 933, 934

Presettlement vegetation 50, 273, 274, 275, 307, 682

Price Ranger Station 656

Priest River Experimental Forest 210, 279, 395, 396

Program administration 3, 125, 194, 195, 196, 197, 198, 199, 516, 517, 518, 528, 542, 798, 815, 853

Pruning 378, 511

Quaking aspen 23, 31, 77, 131, 202, 231, 281, 374, 467, 473, 566, 571, 655, 663, 722, 942, 967

Quinault Indian Reservation 486

Rabbitbrush 22

Railroad fires 697

Random pairs sampling 156, 157, 158, 683

Range economics 677

Range history 2, 27, 159, 184, 427, 481, 537, 564, 632, 638, 667, 736, 849

Range management 7, 27, 28, 61, 91, 136, 149, 159, 160, 170, 176, 184, 260, 278, 293, 302, 319, 347, 361, 362, 375, 390, 391, 392, 427, 441, 442, 481, 507, 537, 567, 617, 618, 619, 633, 634, 638, 648, 663, 664, 665, 666, 667, 668, 669, 677, 679, 702, 718, 728, 736, 775, 815, 849, 850, 858, 907, 909, 910, 913, 954

Range mapping 858

Range seeding 633, 850

Record keeping 5, 825, 826

Red alder 202, 277

Red Boy mill 419

Red Boy mine 595, 596, 601

Red fir 739

Red oak 837

Reference list 294, 347, 854

Release 873

Remote sensing 721

Repeat photography 959

Research Compilation File 626, 854

Research methods 857

Ribes 374, 561, 609, 791

Rimrock 61, 216, 289, 388, 608, 609, 610, 611, 612

Ritter Hot Springs 289

Ritter OR 289

Roadless areas 510, 799

Roads 737

Rock Creek 456, 842

Rocky Mountain Douglas-fir 30, 31, 33, 78, 79, 81, 201, 210, 211, 222, 231, 374, 552, 561, 562, 566, 571, 582, 591, 602, 614, 655, 833, 897, 905

Rocky Mountain maple 374

Rocky Mountain ponderosa pine 371

Rocky Mountains 145, 148, 295, 444, 445, 643, 662, 741, 748, 749, 750, 751

Rodent control 602

Rodent repellents 181, 699

Rodgers Ridge experimental plot 326, 327, 328

Rogue River NF 492, 513

Root systems 936

Rose 22

Round Prairie Spring 910, 913

Runoff 317, 478, 668

Rushes 703

Saddle Butte 64

Sagebrush 22, 615, 634

Salix 386

Salmon 834

Salmon NF 845

Salmon River 179

Sampling 156, 157, 158, 683, 857

San Francisco Mountains 566

San Juan County WA 715

Sandy River 180

Sanitation-salvage cutting 286, 365, 529, 531, 532, 710, 946

Scabland 582, 583, 584, 585, 586, 587, 588, 592, 593, 594, 613, 615

School Canyon 901

Second-growth stands 436, 513, 831, 940

Sedges 703

Seed collection 126, 165, 204, 742

Seed crops 568, 982

Seed germination 210, 383

Seed predation 383, 864

Seed processing 765, 972

Seed source 922

Seed storage 297, 766

Seedling transplanting 477, 823, 972

Selection cutting 58, 247, 529, 531, 557, 558, 620, 704, 725, 818, 819, 820, 821, 826, 829, 833, 940, 941, 959

Selective cutting 276, 370, 430, 431, 470, 521, 529, 531, 726, 950, 951, 952

Serviceberry 22, 967

Shade tolerance 25, 865, 980

Shade trees 443, 515

Shagbark hickory 837

Sheep and lambs 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130

Sheep grazing 7, 27, 28, 136, 160, 161, 170, 184, 278, 302, 307, 319, 394, 427, 507, 537, 540, 583, 603, 604, 633, 659, 663, 667, 677, 736, 849, 906

Shelterbelts 877, 878

Shelterwood cutting 24 7

Sherman County OR 270

Shipmast production 449

Shrubs 330

Sierra Nevada Mountains 186, 309, 540

Silver Creek ID 373

Silvics 23, 131, 139, 146, 154, 202, 205, 214, 215, 219, 222, 241, 267, 277, 281, 295, 371, 386, 444, 445, 448, 469, 473, 522, 530, 686, 741, 743, 748, 749, 750, 751, 770, 832, 881, 942, 967

Silvicultural prescriptions 859

Silvicultural systems 25, 44, 247, 369, 403, 404, 436, 512, 528, 688, 759, 818, 819, 820, 821, 829, 833, 863, 959, 971

Silviculture 24, 25, 31, 33, 168, 205, 370, 371, 373, 430, 431, 511, 513, 532, 654, 725, 726, 761, 831, 859, 865

Silvies River 60

Site index 928

Site preparation 852

Siuslaw NF 109, 181, 494, 496, 504, 776

Skagit County WA 438, 499

Skamania County WA 18, 779

Skookum Creek 611

Slash 398, 778

Slash disposal 263, 533, 957, 958

Slash pine 800

Slash treatment 398, 520, 534, 778, 939

Smoker-caused fires 631, 700

Snags 561

Snake River 179

Snohomish County WA 716

Snoqualmie NF 105, 108, 110, 491, 495, 716, 717
Snow accumulation 478
Snow interception 478
Snowberry 22, 374
Snowbrush ceanothus 374, 562, 587, 596
Soil erosion 28, 325, 375, 429, 668
Soils 30, 32, 193, 684
South Fork Walla Walla River 326, 327, 328, 334, 335
South Umatilla Working Circle 785, 786, 868, 870, 871
Southeastern United States 724
Southeastern Washington 9, 18, 49, 51, 357, 628, 660, 890, 891, 892, 935, 936, 937
Southern California 309
Southern hardwoods 173
Southern Idaho 22, 845, 967
Southern Oregon 474, 521, 565, 931
Southern pines 450, 451, 452
Southern Rocky Mountains 571
Southwestern United States 167, 286, 293, 377, 428, 569, 570, 635, 724, 773, 970
Southwestern Washington 18, 779
Spherical densiometer 178, 738
Spot seeding 836, 837, 838, 839
Spruce beetle 299, 351, 811
Spruce-fir forests 43, 213, 404, 722, 759
Squaw Creek 11, 767, 768
Stand density 514, 649, 731, 859
Stand Density Index 649
Stand diagnosis 859
Stand examination 859
Stand growth 57, 959
Starkey Experimental Range 618
Stayawhile Spring 142
Stem exclusion 554
Stock driveway 585, 586
Stockade Spring 908, 914
Stocking-level curves 859
Strawberry Mountains 420
Stump removal 53
Subalpine fir 131, 202, 211, 213, 273, 281, 374, 473, 553, 560, 561, 589, 597, 598, 606, 711, 751, 818, 967

Subalpine grasslands 604, 617

Subalpine zone 171, 395, 566, 601, 605, 643, 662

Sugar pine 154, 277, 476

Summer Creek 72

Summer homes 597

Summit Creek 11

Sumpter OR 412, 414, 415, 423, 553, 949

Swale Creek 99, 388, 611

Swamp Creek 257

Table Rock 606

Table Rock Mountain 904, 912

Target Meadows 143, 657

Tenderfoot Basin 617

Theory of evolution 727

Thimbleberry 22

Thinleaf alder 131, 202, 281, 374, 473, 967

Thinning 206, 306, 452, 543, 731, 732, 865, 933

Thompson Creek 608

Three Forks 78

Thurston County WA 110, 777

Tillamook County OR 776

Timber compartments 794, 795, 796, 862

Timber defects 52, 95, 365, 431, 650, 723, 726, 948

Timber disposal 876

Timber fraud 385, 639

Timber harvesting 4, 5, 154, 228, 229, 263, 346, 436, 528, 557, 558, 704, 758, 784, 785, 786, 787, 869, 870, 871, 872, 894, 896, 902, 903, 941, 970

Timber industry 379, 774, 901

Timber management 168, 324, 340, 341, 342, 344, 345, 361, 403, 436, 446, 450, 654, 800, 825, 826, 832, 868, 971

Timber management plan 344, 345, 868

Timber marking 725, 818, 819, 820, 821, 829, 833

Timber measurements 94, 200, 249, 482, 536, 844

Timber reconnaissance 138, 355, 359, 827, 828

Timber sale administration 876

Timber sale bid protest 841

Timber sales 4, 10, 11, 60, 152, 185, 200, 252, 253, 254, 256, 259, 261, 346, 364, 431, 455, 456, 457, 458, 459, 460, 461, 462, 484, 723, 725, 726, 733, 734, 784, 785, 786, 787, 818, 819, 820, 821, 829, 833, 840, 841, 844, 855, 856, 866, 869, 870, 871, 872, 884, 946, 959

Timber salvage 238, 367, 797, 860

Timber scaling 844

Timber stand improvement 873

Timber surveys 98, 246, 257, 258, 259, 324, 340, 341, 342, 816, 842, 843

Timber trespass 884

Timber volume 94, 127, 128, 200, 201, 245, 257, 258, 280, 320, 321, 324, 340, 341, 342, 344, 345, 519, 701, 774, 793, 801, 868, 874

Timber yields 58, 139, 266, 276, 344, 345, 434, 444, 463, 467, 470, 471, 519, 521, 522, 530, 868, 894, 902, 903, 923, 928, 951, 952, 970, 976, 977

Tollgate-Bone Spring road 264

Tooele Valley 348

Tower Mountain 588, 589

Toxaphene 962

Trail Creek 555, 559

Training guide 876

Transition type 73, 74, 83

Transpiration 640

Tree diseases 282, 428, 443, 466, 719, 791, 846, 920, 943, 944, 945, 946, 947

Tree distribution 397, 448, 743

Tree growth 25, 57, 482, 959

Tree improvement 41

Tree measurements 94, 483, 794, 795, 796, 802, 803, 804, 805, 812, 847, 862

Tree physiology 25, 284, 640, 645, 980

Tree planting 283, 292, 372, 382, 383, 410, 447, 449, 477, 543, 730, 742, 780, 823, 836, 837, 838, 839, 877, 878, 881, 922, 972

Tree pruning 451

Tree volume 320, 321, 701

True firs 751

Tucannon Ranger Station 217, 837, 898, 911, 915

Tucannon River 216, 217, 218, 220, 897, 901, 905

Tucanon Creek 218, 897, 905

Tupper Butte 611

Tupper Ranger Station 2

Turpentine beetles 299, 351, 811

Turpentine production 183, 800

Twin Buttes 144

U.S. Forest Service history 16, 45, 221, 292, 313, 394, 550, 624, 636, 642, 854

U.S. Geological Survey 926

Ukiah RD 806

Umatilla barometer watershed 879

Umatilla County OR 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130, 384, 439, 564, 634, 670, 671, 673, 675, 744, 745, 746, 747, 885, 886, 890, 891, 892

Umatilla Indian Reservation 21, 673, 744, 745, 746, 747

Umatilla NF 2, 15, 36, 42, 48, 49, 54, 59, 61, 62, 63, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 98, 99, 100, 101, 102, 103, 111, 128, 136, 142, 143, 144, 149, 170, 185, 187, 188, 190, 193, 195, 197, 213, 214, 215, 216, 217, 218, 219, 220, 223, 224, 225, 233, 237, 238, 239, 246, 255, 262, 263, 264, 288, 289, 296, 302, 303, 304, 305, 307, 310, 312, 316, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 341, 344, 345, 355, 357, 362, 367, 383, 387, 388, 389, 390, 391, 400, 405, 406, 419, 426, 437, 439, 440, 456, 457, 459, 462, 479, 502, 503, 510, 519, 520, 542, 544, 545, 560, 563, 577, 580, 581, 582, 583, 584, 585, 586, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 656, 657, 672, 673, 678, 679, 698, 705, 708, 720, 734, 740, 744, 745, 746, 747, 757, 767, 768, 774, 775, 782, 784, 785, 786, 790, 794, 797, 799, 801, 835, 836, 838, 839, 840, 841, 842, 843, 846, 850, 860, 861, 868, 874, 879, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 924, 925, 929, 953, 960

Umatilla River 75, 76, 84, 87, 88, 99, 180, 223, 879, 917

Umatilla Working Circle 341

Umpqua NF 494, 526, 527

Uneven-aged management 58, 654

Union-Campanion mill 421, 424

Union County OR 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 130, 379, 426, 439, 670, 671, 675, 705, 708, 767, 768, 799

Unique trees 644

United States 448, 729, 731, 732, 792, 815, 888, 916, 979

Urban forestry 543

Utah 23, 24, 159, 348, 372, 467, 663, 668, 669, 760, 978

Utah juniper 566

Vancouver WA 485

Variable-radius sampling 683

Vegetable growing 17

Vegetation classification 25, 37, 147, 155, 244, 348, 376, 401, 464, 634, 684, 685, 695, 858, 927, 935, 937, 956, 978, 981

Vegetation types 924

Vegetational zonation 31, 171, 291, 314, 395, 396, 397, 566, 567, 575, 643, 662, 963

Vegetative propagation 386

Volume tables 58, 94, 249, 266, 295, 320, 470, 701, 923, 976, 977

Wagon roads 129

Wahkiakum County WA 500

Wall Creek 99, 387, 389

Walla Walla Block 15, 787

Walla Walla County WA 49, 357, 890, 891, 892

Walla Walla RD 62, 69, 75, 76, 77, 82, 84, 87, 88, 143, 264, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 459, 599, 604, 605, 606, 656, 657, 774, 782, 837, 882

Walla Walla River 180, 307, 890, 891, 892

Walla Walla Treaty of 1855 21

Walla Walla WA 17

Walla Walla watershed 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338

Walla Walla Working Circle 787, 869, 882

Wallowa County OR 48, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 379

Wallowa Forest Reserve 141, 198, 199, 234

Wallowa Mountains 575, 617

Wallowa NF 128, 152, 191, 200, 202, 257, 276, 383, 458, 484, 567, 577, 665, 728, 733, 790, 801, 835, 874, 883, 957, 983

Wallowa-Whitman NF 26, 47, 48, 58, 90, 111, 140, 141, 152, 191, 198, 199, 202, 233, 234, 259, 273, 291, 301, 304, 305, 342, 367, 391, 392, 400, 411, 412, 414, 415, 417, 418, 421, 423, 424, 426, 439, 455, 457, 458, 459, 479, 484, 510, 513, 519, 552, 553, 555, 556, 557, 559, 560, 561, 562, 576, 578, 587, 589, 603, 618, 664, 673, 704, 705, 706, 708, 709, 728, 767, 768, 824, 860, 861, 883, 944, 945, 949, 957, 961, 983

Wallowa-Whitman Working Circle 342

Walnuts 750

Warm Springs Indian Reservation 358, 489

Wasatch Mountains 374, 467, 669

Wasatch NF 22

Wasco County OR 130, 358

Washington 18, 125, 127, 129, 229, 280, 296, 298, 506, 512, 516, 517, 518, 650, 788, 793, 798, 853

Washington County OR 501

Washington history 51, 294

Water birch 131, 202, 281, 473, 967

Water development 384, 886

Water quality 399, 660, 917

Water use efficiency 640

Water yield 160, 317, 478, 640

Watershed management 66, 71, 179, 180, 193, 317, 325, 326, 329, 330, 331, 332, 333, 335, 361, 399, 478, 660, 879, 890, 891, 892, 917

Watershed protection 318, 375, 399, 429, 658, 729

Weeks law 579

Wenaha Forest Reserve 362, 679

Wenaha NF 3, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 91, 129, 170, 213, 215, 216, 217, 218, 219, 220, 233, 280, 359, 362, 380, 437, 598, 607, 616, 678, 679, 782, 790, 835, 837, 874, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915

Wenaha River 607, 616

Wenaha-Tucannon Wilderness 144

Wenaha Working Circle 870, 871

Wenatchee NF 46, 491, 510

West Umatilla Project 384, 885, 886

Western Canada 35

Western dwarf mistletoe 377

Western hemlock 210, 281, 431

Western juniper 78, 131, 201, 202, 473, 574

Western larch 90, 131, 201, 202, 210, 211, 214, 241, 273, 277, 281, 283, 322, 369, 406, 473, 555, 556, 561, 562, 574, 598, 711, 723, 748, 832, 833, 944, 949, 955, 967

Western larch borer 578

Western Montana 654, 922

Western Oregon 523, 533, 661, 831

Western pine beetle 52, 100, 101, 102, 167, 224, 299, 350, 351, 474, 577, 578, 706, 709, 710, 811, 938, 960

Western red rot 428

Western redcedar 210, 211, 281, 680, 748

Western spruce budworm 36, 54, 99, 101, 102, 190, 223, 225, 239, 303, 304, 305, 316, 339, 351, 545, 720, 757, 799, 845, 861, 880, 961, 962

Western United States 25, 35, 177, 251, 287, 318, 351, 471, 638

Western Washington 533, 831

Western white pine 41, 61, 83, 91, 131, 174, 210, 211, 214, 266, 267, 275, 277, 281, 283, 297, 369, 374, 382, 398, 410, 431, 473, 574, 577, 680, 719, 749, 778, 783, 821, 928, 948, 982

Whatcom County WA 438

Wheeler County OR 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 502, 503

White alder 473

White fir 131, 214, 277, 374, 466, 473, 566, 711, 739, 751, 967

White pine blister rust 41, 472, 719, 783, 791

White Salmon River 180

Whitebark pine 131, 191, 202, 273, 473, 560, 577, 578, 749

Whitman Mission 51

Whitman NF 10, 11, 26, 59, 90, 128, 167, 191, 201, 214, 239, 241, 245, 246, 252, 258, 283, 301, 382, 383, 410, 437, 455, 461, 462, 469, 532, 576, 577, 578, 619, 704, 706, 709, 723, 725, 726, 790, 801, 824, 835, 855, 874, 883, 884, 940, 941, 944, 945, 949, 950, 951, 952, 957

Whitman Trail 51

Whitney OR 552

Wildcat Creek 484

Wildflowers 145, 148

Wildlife management 61, 85, 86, 91, 149, 361, 407, 408, 409, 535, 551, 641, 771, 772, 775, 916

Willamette NF 465, 494, 505

Willamette Valley 475, 918

Willow Creek 99, 180, 925

Willows 131, 202, 281, 386, 473, 627, 750, 967
Wilson Prairie 101, 102, 224
Wind damage 661
Windbreaks 34, 384, 762, 763, 808, 877, 878, 885, 886
Windthrow 661, 704, 941, 951, 952
Winema NF 524, 526, 527
Winter range 334, 335
Winterfat 22
Wood characteristics 90, 154, 173, 308, 322, 752, 756, 814, 942, 955, 970
Wood decay 969
Wood energy 887
Wood floors 285, 756
Wood preservation 308, 814, 969
Wood utilization 285, 323, 453, 814
Woodworking 173
Yakima County WA 717
Yakima Indian Reservation 106, 717
Yamhill County OR 504
Zectran 339, 788, 797, 799, 860, 880
Zygadenus elegans 442
Zygadenus paniculatus 442

APPENDIX 2: REFERENCE MATERIALS IN THE HISTORY ARCHIVES

This appendix summarizes the reference materials available in the history archives of the Umatilla National Forest silviculture library. A computer program called ProCite is used to catalogue and manage the historical accessions. The information in this appendix was generated from ProCite by using a customized output style. Each historical accession is summarized in a standard bibliographic format (Forest Service ANSI), including an abstract, keyords, and selected ancillary information (notes, size, etc.) when appropriate. This information was current as of April 23, 1999. New accessions are acquired regularly, so it is anticipated that this document would be revised every year or two to reflect the recent acquisitions.

1. **Abbott, Henry L. 1857**. Explorations for a railroad route, from the Sacramento Valley to the Columbia River. In: Williamson, R. S.; Abbot, Henry L., editors. Reports of explorations and surveys, to ascertain the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean. Washington, DC: U.S. Senate, 33rd Congress, 2nd Session, Executive Document No. 78: Volume VI: 1-129.
   Notes:Printed from microfilm obtained from the University of Minnesota on inter-library loan.
   Abstract: This material is part 1 of a 4-part volume (Volume VI) in the 12-volume Pacific Railroad Surveys project completed by the War Department. Part I, the material covered by this citation, is the General Report. Part II was the Geological Report; Part III was the Botanical Report; and Part IV was the Zoological Report. This volume also included 6 appendices, most of which dealt with the astronomical observations made along the route and other surveying matters. Part I of this report did not turn out to be as helpful as anticipated, since the route being examined went through central Oregon (from the Dalles to the Klamath Basin area) and did not include any information for the Blue Mountains. Note: approximately 30 pages from the Botanical Report were also printed; they contain some general narrative, and detailed descriptions for some of the tree species encountered along the route. The Botanical Report also included some excellent line drawings of certain plant species, although none of those are included in the material that was printed from that part.
   Keywords: Historical document/Deschutes River Valley/Cascade Mountains/Botany/Pacific Railroad Surveys/ Central Oregon.

2. **Aldous, A. E. 1914**. Memorandum office report of trip on Umatilla Forest, September 15 to 18, inclusive. Unpublished Typescript Report. Washington, DC: U.S. Department of Agriculture, Forest Service. 18 p.
   Notes: An original copy.
   Abstract: This accession consists of a 13-page report by Grazing Examiner A. E. Aldous, and two memoranda – a 3-page memorandum (dated 2/1/1915) from an Acting Assistant Forester (Chief) to the District (Regional) Forester in Portland, and a two-page memo (dated 2/6/1915) from the District Forester to Forest Supervisor Cryder in Heppner, Oregon. The report by Aldous describes a 4-day examination that he completed during September of 1914, when he visited areas near the Dixon Ranger Station, Herron Ranger Station, Tupper Ranger Station, and Arbuckle Mountain. It includes the following sections: itinerary; description; grazing types; type 6 (conifer type); and grazing reconnaissance. The author noted that "practically all of the more readily accessible range on the Forest had been very heavily grazed for years before the Forest was created. As a result, large areas have been badly overgrazed. Included in these are the scab lands described previously, and a large part of the open and scattering yellow pine lands." He also commented on forest conditions: "throughout the conifer type there is ample reproduction to more than replace the present stand of timber. The major part of the reproduction has come in since the Forest has been protected against fires. Several areas were noticed where the yellow pine seedlings were so thick that it was almost impossible to ride through them. Practically all of the stockmen were complaining that the reproduction is coming in so thick on their allotments that it is greatly decreasing the carrying capacity of the range." The report includes two excellent black-and-white photographs, one showing a scabland area where the lava occupies less than 7/10 of the exposed surface cover, the other showing a scabland where protection would not be advisable on account of the lava occupying at least 8/10 of the exposed surface cover. The memoranda summarize salient points from Aldous' report and offer recommendations about an appropriate response to it.
   Keywords: Dixon Guard Station/Grazing damage/Heppner RD/Livestock grazing/Range history/Umatilla NF/ Historical document/Historical photograph/Herron Ranger Station/Tupper Ranger Station/Arbuckle Mountain.

3. **Allen, E. T. 1906**. Report on the Wenaha Forest Reserve. Unpublished Typescript Report. Tacoma, WA: U.S. Department of Agriculture, Forest Service. 40 p.
   Notes: A digital version of this report is available; filename: Wenaha1. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.
   Abstract: After establishment of forest reserves and national forests early in the twentieth century, inspections

were supposed to be made at regular intervals. Initially, they were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This inspection report includes the following sections: timber sales; grazing; planting; dendrology; claims and privileges; additions and eliminations; personnel, equipment and protection; and miscellaneous and concluding remarks. Allen offers some interesting insights about forest ecology, as illustrated with this quote: "The timbered area is gaining, rather than decreasing, and apparently only the simplest precautions are needed to provide for restocking cut over tracts, such as proper disposal of refuse protection of small yellow pine, and, when possible, taking the latter species chiefly from north and east slopes or flats. Generally it will not be necessary to watch cutting methods very closely to insure perpetuation of the forest, for it will be attained with ordinary care."
Keywords: Historical document/Wenaha NF/Program administration/Blue Mountains.

4. **Ames, F. E. 1910**. The conduct of timber sales. Unpublished Paper. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 17 p.
Notes: A digital version of this report is available; filename: Ames1. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This paper was delivered at the District 6 Supervisor's Meeting on March 22, 1910. It describes the early timber sale program on national forest lands of the Pacific Northwest. The following topics are discussed: the place silviculture occupies in national forest work, examination of timber for sale, payment on the basis of an estimate, prices, cost data, and reports of timber sold and cut.
Keywords: Forest history/Pacific Northwest/Timber sales/Timber harvesting/Historical document.

5. **Ames, F. E. 1909**. Record of cut-over areas. Memorandum with SS file designation. [Portland, OR]: [U.S. Department of Agriculture, Forest Service]. 3 p.
Notes: A digital version of this report is available; filename: Cutover1. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This document is a fairly short memorandum from F. E. Ames, Chief of Silviculture (for the Pacific Northwest District?), to the forest officers. It was shown with an SS (Silvicultural Studies?) file designation (District - Studies). The memo references a May 20, 1907 memo regarding a "Record of Cut-over Areas" form, as well as direction in the annual field program guidance for September 1908. The primary purpose of the memo was to emphasize that forest officers should be making better use of form 248 (Record of Cut-over Areas) and to stress that all cut-over areas should be examined at least once every three or four years. Although the Forest Service had been in existence for only 2 years when the 1907 memorandum was written, it was already apparent that the District Office believed that forest officers were deficient in their record keeping responsibilities, at least as far as timber sale areas were concerned. Portions of the memo were designed to convince the forest officers that record keeping was a good idea and worth their valuable time. Ames also requested that forest officers send copies of any completed Form 248s to him for his files.
Keywords: Historical document/Timber harvesting/Record keeping/Cutover areas.

6. **Anders, J. M. 1882**. Forests – their influence upon climate and rainfall. The American Naturalist. 16: 19-30.
Notes: A photocopy of the original article published in January, 1882.
Abstract: This article was written during an era of lively debate about the influence of forests, and vegetation cover in general, on the climate of an area. The author describes many ways in which he believes that forests influence climate by their impact on humidity, principally by affecting moisture retention and storage, ambient temperatures, transpirational additions of moisture to the atmosphere, and by promoting heavy dews. Anders supports many of his contentions using experimental evidence.
Keywords: Forest influences/Climate/Historical document.

7. **Andrews, H. J. 1949**. Range management planning handbook. Unnumbered Typescript Handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p.
Notes: An original copy.
Abstract: This handbook provides instructions for preparation of range management plans for the Pacific Northwest Region of the U.S. Forest Service. It contains the following sections: range management planning; range condition and trend standards; District objective statement; allotment objective statement (cattle); allotment objective statement (sheep, 2 examples); graphic section (cattle); graphic section (sheep, 2 examples); rangers field plan (cattle); rangers field plan (sheep, 2 examples); and range manager's and herder's range management plan samples (consisting of three small booklets).
Keywords: Cattle grazing/Grazing/Historical document/Livestock forage/Range management/Sheep grazing.

8. **Andrews, H. J.; Cowlin, R. W. 1937**. Forest type map, state of Oregon, northeast quarter. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station, Forest Survey Staff. 1:253440; Lambert; 35" x 50"; Colored Thematic. **Notes**: A photographically derived copy of an original.
Abstract: This map is a generalized forest type map for the northeastern quarter of the state of Oregon. It was based on detailed type mapping published the previous year on a county-by-county basis. Unlike the county-based type mapping, ancillary or secondary information is not included in the attribute coding, such as stocking, age, seral species, or identification of logged areas. The legend for this map includes two non-forest types, three non-commercial types and twenty timberland types. An original copy of this map was located in the forestry library of the University of Washington in Seattle; it was photographed by the University and the resulting negative sent to Photocraft in Portland, Oregon to produce a paper print. This map was digitized from the paper print and it is available in the Umatilla National Forest's geographic information system. Refer to the Blue Mountain Province Data Dictionary for further information about the digital version of this map.
Keywords: Blue Mountains/Forest types/Historical map/Maps/Northeastern Oregon.

9. **Andrews, H. J.; Cowlin, R. W. 1936**. Forest type map, state of Washington, southeast quarter. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station, Forest Survey Staff. 1:253440; Lambert; 36" x 61"; Colored Thematic. **Notes**: An original copy.
Abstract: This map is a generalized forest type map for the southeastern quarter of the state of Washington. It was based on detailed type mapping published the previous year on a county-by-county basis. Unlike the county-based type mapping, ancillary or secondary information is not included in the attribute coding, such as stocking, age, seral species, or identification of logged areas. The legend for this map includes two non-forest types, three non-commercial types and twenty timberland types. This map was digitized and it is available in the Umatilla National Forest's geographic information system. Refer to the Blue Mountain Province Data Dictionary for detailed information about the map's legend.
Keywords: Blue Mountains/Forest types/Historical map/Southeastern Washington/Maps.

10. **Andrews, W. T. 1911**. Proposed timber sale, Dry Fork Clear Creek, application of Sumpter Timber and Lumber Company. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 36 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes a tract of timber that was cruised and mapped by an intensive reconnaissance crew comprised of students from forestry schools in the eastern United States. After the Sumpter Timber and Lumber Company applied for a timber sale in the area that had been cruised, namely the Dry Fork Clear Creek drainage in the Whitman NF, the area was inspected by Assistant District (Regional) Forester Ames and Lumberman Andrews, who was presumably representing the applicant. Ames and Andrews did not find the reconnaissance crew's estimates to be entirely satisfactory, so a hasty check of 34 of their acre-estimate lines was made and it was decided that yellow pine volumes should be increased by 12% and that the volume of other species should be reduced by 14%. This report includes the following sections: foreward; description of the tract; private interests; old cuttings; topography; soil; reproduction; character and condition of the forest; accessibility; general information; marking timber and handling the sale; summary of the reconnaissance crew's estimate (detailed estimates, by 40s, of the surveyed portion of the tract is provided in a series of tables); and an appendix. Although this report does not include a map, it appears that the examined area is now within the Malheur NF (Long Creek Ranger District).
Keywords: Blue Mountains/Forest inventory/Historical document/Malheur NF/Timber sales/Whitman NF/Dry Fork Clear Creek/Long Creek RD.

11. **Andrews, W. T.; Merritt, Melvin L. 1910**. Head watershed: Middle Fork John Day River; Whitman National Forest, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 83 p. **Notes**: A digital version of this report is available; filename: Whitman2. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes a timber sale examination made in July and August of 1910 by a private lumberman (W. T. Andrews) and a Forest Service Forest Assistant (Melvin L. Merritt). The examination was made in the expectation that either of two private timber companies, the Sumpter Lumber & Timber Company of Baker City, Oregon or the Garrow and Bannon Company of Sumpter, Oregon, would request a government timber sale in a particular area of the Whitman National Forest. The tract they examined was 27,622 acres about 5 miles from Austin, Oregon, and included lands within the Squaw Creek, Idaho Creek, and Summit Creek watersheds (referred to as blocks in the report). All of the examined area is apparently located within the Malheur NF at the present time. The report includes the following sections: block descriptions, private and other related interests, old cuttings, topography and surface characteristics, soils, character and condition of the forests, reproduction, accessibility, additional

information, rules for marking and sale administration, and recommendations. Appendix materials include large-format tables that show species information (grouped by western yellow pine and other species) for individual forties (forty-acre subdivisions of a section) within each of the three blocks.
Keywords: Forest inventory/Timber sales/Whitman NF/Malheur NF/Squaw Creek/Idaho Creek/Summit Creek/ Blue Mountains/Historical document.

12. **Anonymous**. **1933**. Pioneer eastern Oregon lumber firm. The Timberman. 34 (September): 48-49.
Notes: A photocopy of an original.
Abstract: The subtitle of this article is: David Eccles cuts ties for Oregon short line in 1887 and founds Oregon Lumber Company in 1889. This short article discusses how David Eccles emigrated to eastern Oregon from Utah in 1887 and constructed railroad tie mills at North Powder, 20 miles west of Baker City, and at Pleasant Valley, 13 miles east of Baker City. His mills manufactured the ties used for the Oregon Short Line railroad, constructed in northeastern Oregon as a connecting link between the Union Pacific and Oregon-Washington Railroad and Navigation Company lines. He built the first sawmill located at Baker City in 1889, calling it the Oregon Lumber Company. At that time, he purchased extensive tracts of private timberland, including a large parcel on the Middle Fork of the John Day River. Eventually, Eccles acquired or built other sawmills in the state, including operations at Hood River and Ingles. He secured large holdings around the base of Mount Hood and became well known for his "Mt. Hood" Douglas-fir and hemlock lumber, and the "John Day" ponderosa pine valued for its excellent quality and texture.
Keywords: Community development/Eastern Oregon/Forest history/Historical document/John Day River/Lumber production/Grant County OR/Northeastern Oregon/Ponderosa pine.

13. **Arrington, Joseph Earl**. **1964**. Skirving's moving panoramas: Colonel Fremont's western expeditions pictorialized. Oregon Historical Quarterly. 65 (2 (June)): 133-172.
Notes: A photocopy of an original. Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article provides background information about a pictorial panorama painted by John Skirving in 1849-50. The basis for his panorama was the work of several expeditions into the western country, particularly those of John C. Fremont, who in popular conception came to embody western explorers. Fremont's expeditions, and the profusion of maps resulting from them, caused him to be known as the "Pathfinder of empire." Although tied closely to Skirving's panorama, this article provides some good insights and background into western explorations by Fremont, Wilkes, and others.
Keywords: Eastern Oregon/Historical document/Oregon history/John Fremont.

14. **Ashby, Charlotte M. 1967**. Preliminary inventory of the cartographic records of the Forest Service. Number 167; National Archives Publication No. 67-5. Washington, DC: The National Archives, National Archives and Records Service, General Services Administration. 71 p. **Notes**: A photocopy of an original.
Abstract: The records described in this document are the map files of the Forest Service in the National Archives as of September 22, 1966. They are part of record group 95, Records of the Forest Service, and amount to 255 cubic feet. There are 14,737 discrete items (reports, atlases, and individual maps). The textual records of the Forest Service have been described in Preliminary Inventory No. 18 (see Pinkett 1949). An index to the records described in each entry is included in the inventory. Since many of the entries do not specify all the maps by area, name of national forest or other administrative area, or subject, the index has been designed to provide that information. Names of national forests have been indexed, but no attempt has been made to bring those maps up to date with the continuing name and boundary changes that have occurred since the forests were first established. Early aerial photographic surveys of the Forest Service, dated from 1934 to 1938, were accessioned by the National Archives after September 22, 1966, and are not described in this inventory.
Keywords: Cartographic data/Maps/Forest inventory/Forest history/National Archives.

15. **[Author unknown]**. **[Date unknown]**. Analysis of Dayton Working Circle, Umatilla National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 15 p.
Notes: A digital version of this report is available; filename: Umatilla7. An original copy, although the cover is missing.
Abstract: This report includes the following sections: introduction (purpose, data sources, previous cutting); physiographic features (location, acreage, topography); forest description (types, probable use of various species, tables of volume and area); economic situation (towns and communities, wood-using industries, transportation, labor situation, ownership problems, private cutting practices); and plan of action (ultimate forest boundary, ultimate circle boundary, sales policy, administrative correlation). This report includes tables summarizing volumes and acreages by block (this working circle included 2 blocks: Walla Walla and Dayton).

Keywords: Historical document/Dayton Working Circle/Umatilla NF/Blue Mountains/Forest management/Walla Walla Block/Dayton Block.

16. **[Author unknown]**. **1952**. Fifty years of forestry. Timberlines. 37-46. **Notes**: A photocopy of an original.
Abstract: The subtitle of this article is: "what happened and who was who, during the forest reserve years." It provides an informative history of forestry in the Northwest, although it goes far enough back in time that much of the historical narrative pertains to American forestry in general. A chronology of forest reserve establishment is provided, along with background information on the politics involving the forest reserves and their establishment. Creation of the Forest Service by Roosevelt and Pinchot is described, as is the Forest Service's transfer to the Agriculture Department after placing the forest reserves under its control. Historical accounts up to the CCC era of the 1930s are included, as are several lists and charts of early Region 6 personnel.
Keywords: Forest history/Forest reserves/Historical document/Pacific Northwest Region/Gifford Pinchot/U.S. Forest Service history.

17. **[Author unknown]**. **[Date unknown]**. Fruit and vegetable growing. [Place of publication unknown]: [Publisher unknown]. [Scale unknown]; [Projection unknown]; Colored Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a single sheet showing a portion of a ¾" to the mile map. Unfortunately, the scale, projection, legend, and other marginalia is missing from the portion of the map that was copied. The copied portion shows the fruit and vegetable growing region in the vicinity of Milton, Oregon and Walla Walla, Washington. Based on the fact that Milton and Freewater are shown as separate towns, and the cartographic style, it is believed that this map dates from 1920 or slightly before. This map was included in hundreds of pages of material that was obtained at the National Archives in March of 1998; unfortunately, it is unknown what report the map may have originally come from or if it inadvertently became separated from a written document.
Keywords: Agriculture/Historical map/Fruit growing/Vegetable growing/Walla Walla WA/Milton OR.

18. **[Author unknown]**. **1869-1910**. Miscellaneous newspaper accounts about early forest fires in Washington. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 11 p.
Notes: A photocopy of an original.
Abstract: This accession consists of cards from a newspaper clipping service, in which accounts of forest fires and their damage were summarized. The cards were apparently 5 1/4 inches high by 8 1/2 inches (or more) wide. Accounts range from short references of a sentence or so to longer accounts for major fires. A very large forest fire that burned in 1902 in northwestern Oregon and southwestern Washington is described in some detail, noting that at least 30 lives had been lost as the fire moved along more than 40 miles of the Lewis River in southwest Washington near the Oregon border in Clarke, Cowlitz and Skamania counties. It mentioned that several people were able to save themselves only by wading in the river with nothing but their heads out of the water. That fire spread from the Lewis River to the Kaloma River, destroying at least fifty sections of timber on the coast. It also mentioned that at least 300 people were left homeless in Multnomah and Clackamas counties on the Oregon side of the Columbia River. [For more information about this fire, which has typically been referred to as the Yacolt Burn, see an item in the history archives entitled "Damage by recent forest fires" by the U.S. Department of Agriculture, Bureau of Forestry. The Yacolt Burn climaxed on September 17, 1902; by its end, over 700,000 acres had been affected.] Of particular interest is a long account of the great 1910 fires from the Vernon County Censor of Viroqua, Wisconsin. It describes how 105 fire fighters and residents were killed by the fires in northern Idaho in areas near Wallace. It mentioned that fire fighters had experimented with exploding dynamite from the limbs of tall trees in the hope of shaking the clouds and invoking rain. This tactic apparently worked in one place for a short time, but was ineffective in quenching the forest fires. The last account in this accession had nothing to do with forest fires; it was an account from The Wisconsin Agriculturist about the fruit growing situation near Vineland, Washington in the Snake River valley. In the account, which was written in 1900, the author extols the virtues of the climate in southeastern Washington and mentions that land is cheap, taxes are low, and that there is plenty of room for more neighbors.
Keywords: Clarke County WA/Clackamas County OR/Fire history/Forest fires/Historical document/Northern Idaho/Northwestern Oregon/Southwestern Washington/Southeastern Washington/Washington/Cowlitz County WA/Skamania County WA.

19. **[Author unknown]**. **[Date unknown]**. Report upon the proposed Colville Forest Reserve, Washington. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Bureau of Forestry]. 13 p. **Notes**: A digital version of this report is available; filename: Colville1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report covers the following topics as they relate to the Colville Forest Reserve in northeastern

Washington: location; area; topography; climate; the forest; list of woody species (trees, and shrubs); industries; mining; settlements; roads and trails; lumbering; fires; sentiment; conclusions and recommendations, and administration necessary.
Keywords: Historical document/Colville Forest Reserve/Colville NF/Forest management/Northeastern Washington.

20. **[Author unknown]**. **1915**. State of Oregon; statistics collected for H. Graves. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 30 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document consists of statistics pertaining to the state of Oregon. A hand-written annotation on the title page states that it was compiled for H. (Henry) Graves, an early chief of the U.S. Forest Service. Based on the number of annotations and revisions included on this copy, it may have been a draft or working copy. It includes the following sections: general statement; areas; soil use, minerals; manufacturing, many industries; lumber industry, population employed, mills reporting; standing timber (Bureau of Corporations report); areas, and timber cut; exports; forest fires; fire associations; state organization with reference to fire; fire protection, cooperation by states; areas, amounts expended; state control; tax, laws, problems; Allen on timber tax; species of timber; education; land of opportunity (products, fruit and grain); beauty, mountains, rivers; discrepancies; 1914 Forester's report (forest fires, burned over land, private ownership, depression, scenic value); and game preserves.
Keywords: Historical document/Oregon.

21. **[Author unknown]**. **1975**. Walla Walla Treaty of 1855. Confederated Umatilla Journal. 5-7.
Notes: A photocopy of an original.
Abstract: This article is from a newspaper or tabloid published in Pendleton, Oregon. It describes the Walla Walla Treaty of 1855, which was negotiated in May and June of 1855 when over 6,000 Indians of the Nez Perce, Yakima, Cayuse, Walla Walla and Umatilla Tribes gathered near old Camp Stevens near Wallula (Camp Stevens was later renamed Fort Walla Walla). The two principal Federal negotiators were Isaac I. Stevens, governor of Washington Territory, and Joel Palmer, governor of Oregon Territory. The governors had originally intended that the Indian Tribes represented at this Treaty Council would move onto a large reservation planned for the Nez Perce in Idaho. As the Council proceeded, the influence of the three chiefs present were able to sway the federal negotiators to establish a new reservation in northeastern Oregon (the Confederated Tribes of the Umatilla Indian Reservation outside Pendleton). A final treaty was signed on June 9, 1855 and the Indians returned to their homes to await its ratification by Congress. Due to the Yakima War that erupted that summer, and other matters, the Treaty was not ratified until nearly four years later on March 8, 1859. A particularly interesting feature of this article is that it reprints the treaty in its entirety: two of the article's three pages consist of the treaty itself.
Keywords: Historical document/American Indians/Walla Walla Treaty of 1855/Native Americans/Umatilla Indian Reservation/Isaac Stevens/Joel Palmer/Oregon history.

22. **Baker, F. S.; Korstian, Clarence F. 1931**. Suitability of brush lands in the Intermountain Region for the growth of natural or planted western yellow pine forests. Technical Bulletin No. 256. Washington, DC: United States Department of Agriculture. 83 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is a detailed and comprehensive report about western yellow (ponderosa) pine and the sites that it grows on in the western United States. The study was initiated to examine why western yellow pine was absent from a belt extending from the Gulf of California northeastward into west-central Montana. In northern Utah and southeastern Idaho, where the belt was several hundred miles wide, the elevational zone at which pine would be expected was occupied by brush-land shrubs. This document includes the following sections: introduction; natural range and occurrence of western yellow pine; temperature, moisture, and soil in the western yellow pine type and brush lands: temperature, moisture (evaporation, mean annual precipitation, seasonal distribution of precipitation, soil moisture, effects of surface and soil moisture on seedling establishment), soil (comparison of western yellow pine and brush-land soils, sensitiveness of western yellow pine to soil conditions), and a specific test of the influence of moisture and soil; results of plantings: experimental plantations (Ephraim Canyon watershed, Manti National Forest, central Utah; Big Cottonwood Canyon, Wasatch National Forest; Beaver Creek watershed, Wasatch National Forest; Mink Creek watershed, Cache National Forest, Idaho), more extensive plantations, and conclusions from studies of plantations; native vegetation as an indication of the suitability of planting sites: failure of successional stage as an indicator, indicator significance of brushland shrubs based on root development (classification of root systems and their significance, deep-rooted species, systems with wide-spreading rhizomes, generalized spreading systems, two-storied systems, comparison of sites), and leaf characters as an indication of soil moisture (size, structure, moisture content, relative transpiration, sap density, relative significance of leaf characters); summary and conclusions; and literature cited. This report includes numerous photographs showing vegetation associa-

tions from throughout the western United States, as well as many high-quality figures, drawings, and tables. In particular, the detailed drawings of root systems for many common and important shrubs of the western United States (rubber rabbitbrush, bitterbrush, joint fir or Ephedra, common serviceberry, sticky currant, Gambel oak, myrtle boxleaf or myrtle pachistima, black chokecherry, Fendler rose, winterfat, mallow ninebark, western thimbleberry, bearberry honeysuckle, mountain snowberry, western yellow pine, pointleaf manzanita, snowbrush ceanothus, russet buffaloberry, clematis, big sagebrush, Fendler ceanothus) are excellent. The detailed discussion about the indicator significance of natural vegetation reflects a common theme of that era; see accessions by Kearney and others (1914), Korstian (1917) and Shantz (1911) for good examples of other studies that examined that topic.
Keywords: Climate/Ephraim Canyon/Forest ecology/Forest influences/Historical document/Indicator plants/Manti NF/Plant communities/Plant succession/Ponderosa pine/Sagebrush/Southern Idaho/Wasatch NF/Cache NF/Big Cottonwood Canyon/Beaver Creek/Mink Creek/Rabbitbrush/Bitterbrush/Serviceberry/Currant/Gambel oak/Pachistima/Chokecherry/Rose/Winterfat/Ninebark/Thimbleberry/Honeysuckle/Snowberry/Manzanita/Ceanothus/Buffaloberry/Clematis.

23. **Baker, Frederick S. 1925**. Aspen in the central Rocky Mountain region. Bulletin No. 1291. Washington, DC: U.S. Department of Agriculture. 46 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This interesting bulletin reports on studies conducted in aspen forests of Ephraim Canyon in central Utah. The following topics are included: distribution, description of the tree, climatic requirements, soil and moisture requirements, shade tolerance, susceptibility to diseases and other injurious agents, reproduction, associated species, growth, yield, properties and uses of the wood, lumbering and logging, and management of aspen forest, including appropriate silvicultural practices.
Keywords: Quaking aspen/Utah/Historical document/Silvics/Forest management.

24. **Baker, Frederick S. 1925**. Character of the soil in relation to the reproduction of western yellow pine. Journal of Forestry. 23: 630-634. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: Foresters often expressed the opinion that western yellow (ponderosa) pine reproduced best in sandy soils. This article reports the results of an experiment conducted at the Great Basin Experiment Station in Utah that examined the effects of soil texture and chemistry (acidity and alkalinity) on yellow pine reproduction. Six different kinds of soil were used for the study: an acidic “lodgepole pine” soil derived from basaltic rock of the Yellowstone Plateau; a slightly acidic soil called “manzanita” because it was obtained from an area supporting manzanita brush *(Arctostaphylos pungens)* in Ephraim Canyon, Utah; a neutral soil termed “white fir” as it was collected from a white fir type not far from the manzanita sample; a slightly alkaline soil obtained from a yellow pine area in the southeastern portion of the Manti National Forest in central Utah; an alkaline soil called “aspen” as it was collected from an aspen stand near the experiment station; and a very alkaline clay soil obtained from a swampy area near the experiment station. Results from the germination and first-year survival tests did not show any relationship between yellow pine survival and soil acidity, as survival was highest for the lodgepole soil and second highest for the clay soil. The size and biomass of the yellow pine seedlings did seem to be related to the amount of organic matter in the soil, with seedling weight being substantially greater for the aspen soil which also had significantly higher amounts of organic matter. Although the study was not definitive or particularly comprehensive, it did seem to show that development of western yellow pine reproduction was conditioned more by the physical character of the soil (texture, porosity) than by any other apparent factor, and that soil acidity was not a limiting factor. While a light soil texture tended to favor the establishment of young seedlings, their survival and growth seemed to be affected primarily by soil fertility.
Keywords: Forest ecology/Forest influences/Great Basin Range Experiment Station/Historical document/Ephraim Canyon/Manti NF/Ponderosa pine/Natural regeneration/Silviculture/Utah.

25. **Baker, Frederick S. 1934**. Theory and practice of silviculture. New York, NY: McGraw-Hill Book Company. 502 p. **Size**: 6½” x 9”. **Notes**: An original copy of the first edition.
Abstract: This book covers reproducing the forest and tending forest stands after they have been established. It is the first edition of a forestry textbook that eventually became a standard in the education of several generations of foresters. [As of 1997, the most recent version is called “Principles of Silviculture” by Daniel, Helms, and Baker (1979).] This book contains the following chapters: introduction; forest genetics; the water cycle; the carbon cycle – photosynthesis; the nitrogen and mineral cycles; growth of trees; reproduction of the forest; injury, disease and death of forest trees; forest types and sites; form and composition of stands; density of stands; tolerance; the theory of succession; crown classification; silvicultural systems depending on seed for reproduction; coppice forests; the analysis of silvicultural systems; intermediate cuttings; field studies in silviculture; applied silviculture; and applied silviculture – western United States.

Keywords: Natural regeneration/Forest ecology/Forest management/Historical document/Improvement cuttings/ Plant succession/Shade tolerance/Silvicultural systems/Silviculture/Tree growth/Tree physiology/Vegetation classification/Western United States.

26. **Barnes, Ephraim**. **1912**. Report on insect infestation control work conducted by the Bureau of Entomology and the Forest Service, Whitman National Forest, spring of 1911. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 15 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes in detail an insect control project that was conducted on and adjacent to the Whitman National Forest during the spring of 1911. The project was directed and managed by the Bureau of Entomology in cooperation with the Forest Service, and involved a small degree of involvement by private land owners in the infested area. Control operations began on April 5th and ended on June 30th. The Bureau directed the technical work of insect control and the method of selecting and treating the trees. H. E. Burke, W. D. Edmonston, and W. B. Turner were the Bureau agents with responsibility for the project; Forest Supervisor Henry Ireland and Deputy Supervisor Ephraim Barnes represented the Forest Service. It seems that Forest Ranger R. E. Smith and Forest Assistant B. T. Harvey may have completed some of the preliminary cruising work prior to initiation of the control project. The Bureau's men seemed to have no definite plan of action for the control work and generally action was only taken after suggestions from Mr. Ireland or the author. Much of this report describes the problems inherent in a large project in which the overall responsibility is shared by two different agencies or entities. Logistical details, camp assignments, work responsibilities, supervision, the handling of employees who were incompetent or unsatisfactory for the control work, and so forth are discussed in great detail. Some of the accounts are humorous, such as the Bureau's employment of a Mr. Farnum who, after reporting to a work camp, promptly became lost in an open yellow pine stand not 400 yards from camp. Another account describes a Bureau employee who was finally able to wrangle a trip into town (Baker City in this instance), ostensibly to get supplies, but he actually spent the whole time drinking and drunk. Barnes ends this report by stating that "these incidents which have been cited are all either directly or indirectly the result of an uncertain division of authority. There was no well defined agreement as to just what the Bureau of Entomology's representatives should do and just what should be done by the Forest Service. Therefore, from past experience it would not seem to be sound business to undertake work of this nature on a large scale at any future time." The report is also accompanied by a three-page memorandum dated February 24, 1912, from Forest Supervisor Henry Ireland to the District Forester in Portland, Oregon; it summarizes some of the findings from Barnes' report while also providing the Supervisor's perspective on the inefficiencies of the cooperative insect control project.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains.

27. **Barnes, Will C. 1926**. The story of the range. Unnumbered Report. Washington, DC: United States Senate, Sixty-ninth Congress. 60 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This report is an account of the occupation of public domain ranges by pioneer stockmen, the effect on forage and land of unrestricted grazing, and the attempts that have been made to regulate grazing practices and perpetuate the great natural forage resources of the open range. It covers the following topics: what pastures mean to the nation; pasture land in the U.S.; the occupation of the range; effect on the forage cover of unregulated grazing; definition of public domain; character of grazing lands on the public domain; the Red Desert region; the West Desert; the Owyhee, and adjoining ranges; Nevada desert ranges; open range lands in New Mexico; movements toward range control; leasing value of grazing lands; management of non-Federal grazing lands; and efforts to provide legislation for range control.
Keywords: Historical document/Range history/Range management/Cattle grazing/Sheep grazing.

28. **Barnes, Will C. 1913**. Western grazing grounds and forest ranges. Chicago, IL: Sanders Publishing Co. 390 p. **Size**: 6" x 8". **Notes**: An original copy.
Abstract: This book covers the following topics: the early western range; progress of the range business; coming of the settlers; live stock on the range; handling cattle on the range; handling sheep on the range; goats on the range; determining the age of stock; range stock management; cost of running stock on ranges; stock on ranges in national forests; the care of the range; poisonous plants; symptoms and remedies; diseases of live stock; the diseases of cattle; diseases of sheep; diseases of horses; insect pests; predatory animals in the west; saddle horses on the range; and horse equipment for range work. The book has copious illustrations, consisting of line drawings for important range plants and black-and-white photographs. Although much of this book deals with the mechanics of range management, the early chapters are particularly interesting because of their historical context. Land grant programs such as the Homestead Act, westward movements by the Mormons and similar groups, range wars, and other im-

portant events in the settling of the West are described in some detail.
Keywords: Range management/Grazing damage/Cattle grazing/Sheep grazing/Historical document/Poisonous plants/Livestock diseases/Forest history/Forest management/Soil erosion.

29. **Bartrum, S. C. 1910**. Fire protection on the national forests: cooperation with states, counties, and organizations. Unpublished Paper. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 15 p.
Notes: A digital version of this report is available; filename: Bartrum1. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This paper was delivered at the District 6 Supervisor's Meeting, held in Portland, Oregon on March 21-26, 1910. It discusses early fire protection efforts in the Pacific Northwest region. The number and acreage of fires is described, as is the value of timber lost to fires. This account provides good insights into fire protection attitudes and policies near the beginning of an era of widespread fire suppression.
Keywords: Forest history/Forest fires/Pacific Northwest/Historical document.

30. **Bates, C. G. 1919**. Forest distribution and succession. Unpublished Typescript Report. Denver, CO: U.S. Department of Agriculture, Forest Service. 22 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: For a number of years before this report was prepared, the Forest Service had been conducting a study known as the "type study," the objective being to investigate the conditions governing the distributions of each species in the mountain forests, both by temperature and moisture zones and in smaller units apparently resulting from soil or edaphic conditions. The work had been initiated earlier, but could not be vigorously pursued during the first World War. This report includes the following sections: previous references to this work; the arrangement of forest types; results; summary; and conclusion. Some of the results obtained from the field and laboratory studies were: the relative water requirements of the several tree species are exactly the reverse of that which would be expected from general study of their habitats (greenhouse studies showed the following order in terms of water requirements, defined as the units of water used in the production of one unit of dry plant matter: limber pine (most), yellow (ponderosa) pine, bristlecone pine, lodgepole pine, Douglas-fir, and Engelmann spruce (least)); the water transpired in unit time per unit of leaf area may show the relative ability of the species to resist water loss under any conditions that are unfavorable for replenishing such loss; the water requirements of a tree species is a function of the osmotic pressure of the solution within its leaves (the ranking of tree species for this relationship followed the exact same order as for the water requirement results); the same osmotic relations have been shown, in part, by the ability of the several tree species to extract moisture from soils; yellow pine in the field is more susceptible to winter-killing than any other species; the zonation of the true forest trees may be governed in a general way by growing season temperatures; soil temperatures have no independent bearing as such, but may be of great importance as indices to moisture conditions; soil moisture, if it directly affects the composition of the forest type, must do so by reaction upon the young seedling; and in the habitats studied during several growing seasons, there was no evidence that the amount of moisture available during the growing season might become so low as to be fatal to established trees. Some of the summary points included: factors which act as distinct barriers to tree reproduction included excessive temperatures which tended to exclude the tree species of higher sap density, soil-freezing when accompanied by high evaporative stress tended to exclude the species of low sap density, and high osmotic pressures in the soil tended to be most inimical to the species of low sap density. Some of the factors which tended to eliminate species as a tree stand developed or matured included: temperatures too low for maintenance of a standard growth rate which affected the species of low sap density first (effects were similar to those associated with insufficient light), periodic drought conditions affecting the deeper soil which also caused adverse reactions in species of low sap density first, and higher osmotic pressures due to aging of the soil which tended to be counter-balanced by the gradual incorporation of humus with the mineral soil component. Some conclusions of the study included: the quantity of moisture apparently present on a site, as judged by precipitation, general conditions of the soil, or by actual moisture measurements, is not an adequate index to the moisture requirements of the tree species that grow there; the drought condition most limiting to many tree species is not the one present during the growing season, but the condition arising in the winter through freezing of the soil; weed trees are those species that can temporarily possess a site on account of short-lived temperature conditions and cannot persist once temperatures have stabilized; and the causes of a phenomenon known as plant succession are to be found in the osmotic status of forest soils, rather than in atmospheric or climatic conditions, since all successions occur from a status of low osmotic pressures to successively higher osmotic pressures. In forestry, and especially with conifer trees, the concern is primarily with the development of high osmotic pressures in the plant, and with the minimum moisture conditions likely to be encountered in any year or climatic cycle, which in combination will determine what tree species can occupy a given site. Forests control the ultimate climax composition by their control over soil structure. For that reason, yellow pine forests may gradually give way to short grasses as the soils of an area age. At higher elevations, Engelmann spruce

possesses enough power to invade grass-dominated areas by gradual amelioration of soil conditions near the existing stand edges.
Keywords: Central Rocky Mountains/Soils/Colorado/Historical document/Forest ecology/Forest influences/Forest types/Engelmann spruce/Limber pine/Lodgepole pine/Plant succession/Ponderosa pine/Rocky Mountain Douglas-fir/Bristlecone pine.

31. **Bates, Carlos G. 1917**. Forest succession in the central Rocky Mountains. Journal of Forestry. 15: 587-592.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article consists of remarks delivered by Bates at a meeting of the Botanical Society in Washington, DC on February 6, 1917. The subject of plant succession has always interested foresters, who recognized early on that denudation of an area was not always followed by return of the original vegetation type. European foresters learned not only about the basic laws of forest succession, but also about how to adjust their systems of forest management and silviculture to account for the expected effects of plant succession. The examples that Bates uses are based on his work in the central Rocky Mountains, particularly the mountainous portions of Colorado and Wyoming. He recognized four climax vegetation zones in that area: the pinon-juniper open woodland forest; the yellow (ponderosa) pine forest; the Douglas-fir forest; and the subalpine spruce forest. He also describes two situations in which direct seeding had been tried and found to be successful – one example was on the Arapaho National Forest along the northern Front Range of Colorado, while the second case occurred in the yellow pine forests of the Black Hills. In both of those instances, the previous forest cover had only recently been removed by forest fire (within a few years at most) and the soil and site conditions were still considered conducive to seed germination and seedling development. Bates discusses succession following fire or cutting in yellow pine forests, when tree regeneration can be impeded by a dense sod of grasses and forbs. Drought, early frosts, and a lack of winter snow cover also affected regeneration in the yellow pine type. He then discusses the Douglas-fir type, which he believed occupied only 5 percent of its original range in Colorado and Wyoming due mainly to losses from fire. The result of extensive fires in the Douglas-fir forest zone was a major "invasion" by lodgepole pine, which would prevent a return to the climax type for at least 500 years. In southern Colorado, there were many disturbed Douglas-fir sites supporting a seral stage of quaking aspen rather than lodgepole pine. Based on regeneration work conducted in the Pikes Peak region, the author came to the following conclusions: seeding of clearcut areas did not occur from the side, but was a result of birds, rodents, or from seed stored in the duff or upper soil; clearcutting gave aspen sprouts a great advantage over conifers; and it would not be possible to eliminate limber pine from mixed stands by simply removing the limber pine seed trees. At the highest elevations, succession following fire in the climax forests of Engelmann spruce did not tend to involve aspen or lodgepole pine, but was dominated by limber pine or bristlecone pine once it reached the forest stage.
Keywords: Historical document/Direct seeding/Engelmann spruce/Fire effects/Forest ecology/Limber pine/Front Range CO/Pikes Peak/Plant succession/Ponderosa pine/Quaking aspen/Rocky Mountain Douglas-fir/Silviculture/Vegetational zonation.

32. **Bates, Carlos G. 1924**. Forest types in the central Rocky Mountains as affected by climate and soil. Bulletin No. 1233. Washington, DC: U.S. Department of Agriculture. 152 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the results of studies that explored the relationship between Rocky Mountain forest types, and climate and soil. The following topics are discussed: study methods, study area descriptions, the growing season, air temperatures, wind and evaporation, soil temperatures, sunshine, precipitation, and soil moisture. A summary covering the general character of the climate, temperature and temperature gradients, wind and evaporation, winter soil temperatures, and precipitation and soil moisture, is also provided. [Note that the history archives includes an unpublished typescript report by C. G. Bates that apparently describes this study in more detail. It is entitled "Forest distribution and succession" (1919).]
Keywords: Mountain climate/Central Rocky Mountains/Soils/Colorado/Historical document.

33. **Bates, Carlos G. 1926**. Some relations of plant ecology to silvicultural practice. Ecology. 7 (4): 469-480.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article is Bates' remarks at a symposium entitled "Forestry and the Basic Sciences," which was also the Pacific meeting of the American Association for the Advancement of Science held in Portland, Oregon on June 17, 1925. It includes the following sections: definitions of silviculture; silvicultural problems in the field of ecology; possibilities of ecological silviculture (forest nursery practice, forest planting, natural reproduction); site conditions versus silvicultural systems; and summary. Bates was asked to discuss the relationship between silviculture and physical site factors, a field of study in which he had done much work. He actually covered a much broader topic dealing with plant ecology and silviculture, since he believed that it was impossible to practice "scientific sil-

viculture" without intimate physiological knowledge of not only the trees, but of the other, undergrowth plants that may aid or antagonize the growth of those trees. Bates provides several examples of what he terms the most important advance in silvicultural – ecological concepts of that era: a conceptual change from using silvicultural treatments to increase light availability to thinnings or other cuttings as a way to increase the moisture supply of tree seedlings. In that respect, Bates was primarily focused on the poor performance of advance regeneration established under a forest canopy, which research had often shown to be caused by root competition between the overstory and understory trees. He uses several examples from the Pikes Peak region (Pike and San Isabel National Forests) of south-central Colorado to illustrate his points, such as the observation that western yellow (ponderosa) pine would not establish itself in shade because it requires full sunlight and can endure high temperatures, whereas Douglas-fir comes in under yellow pine because it can endure moderate shade but not high temperatures. Bates maintains that it is very important to consider physical site factors whenever silviculture is practiced because it is not the kind of cutting that is important, but the resultant physical and environmental conditions resulting from the cutting (i.e., the resultant temperature and moisture conditions). He states that the essence of ecology as applied to silviculture is not embodied in instrumentation to definitively characterize a site's physical factors (such as measuring ambient temperature and moisture conditions), but in teaching the habit of thinking about a site in physical terms.
Keywords: Climate/Forest ecology/Forest influences/Forest management/Historical document/Pikes Peak/Ponderosa pine/Rocky Mountain Douglas-fir/Plant ecology/Plant succession/Silviculture/Front Range CO/Pike and San Isabel NF.

34. **Bates, Carlos G. 1940**. The windbreak as a farm asset. Farmers' Bulletin No. 1405. Washington, DC: U.S. Department of Agriculture. 19 p. **Size**: 6" x 9". **Notes**: An original copy. Originally issued in January 1924; revised November 1936; this version was slightly revised in February 1940.
Abstract: Windbreaks are a farm asset. They tend to prevent the soil from drying out quickly; they protect grainfields and orchards from mechanical injury; and they conserve moisture in crop fields. Trees around the farm buildings protects them from extreme cold in the winter, while also providing shade during hot summer days. Windbreaks can also be a source of wood for the farm, or for sale. This bulletin explains the general principles of windbreak planting, the good and bad effects which may be expected from them, the species that should be planted in specific areas, and the care needed to maintain the windbreak after its establishment.
Keywords: Windbreaks/Historical document/Farm forests.

35. **Bedard, W. D. 1950**. The Douglas-fir beetle. Circular No. 817. Washington, DC: U.S. Department of Agriculture. 10 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: The Douglas-fir beetle is the most destructive insect enemy of Douglas-fir throughout the range of this important timber tree in the western United States and Canada. Every year this small beetle kills millions of board feet of merchantable Douglas-fir timber – one of the most valuable woods for structural timbers, plywood, and airplane stock. The resulting snags stand for years as mute evidence of its destructiveness, often for 25 years in the Rocky Mountain region and from 50 to 100 years in the fir forest along the coast. These snags not only represent a tremendous economic loss but, until they have fallen and rotted, are also a serious fire hazard.
Keywords: Insect damage/Historical document/Western United States/Douglas-fir beetle/Douglas-fir/Western Canada.

36. **Bequette, Bill**. **1948**. Crawling forest killer given 'taste' of DDT by airplanes and helicopters. East Oregonian. July 1; 1-5: 1,12. Pendleton, OR. **Notes**: A photocopy of an original.
Abstract: This article describes an experimental application of DDT, a chemical insecticide, to control a western spruce budworm outbreak. DDT was applied to an experimental area near the Tupper Guard Station on the Heppner Ranger District using both airplanes and helicopters. The article includes quotes from Dr. James Beal of Duke University, who was responsible for monitoring the efficacy of DDT on budworm. The effective use of DDT in 1947 on 14,000 acres of a Douglas-fir tussock moth outbreak near Troy, Oregon provided the impetus to try it against spruce budworm. The article mentions that entomologists employed by the Bureau of Entomology and Plant Quarantine completed surveys in 1947 showing that approximately 710,000 acres of budworm infestation existed in the Blue Mountains. Some of the individuals and cooperators involved with this project were the Umatilla NF; the Bureau's Insect Lab in Portland; Kinzua Pine Mills from Heppner; John Wood, Jr., an assistant State forester from Salem; Charles Eaton of the Beltsville, Maryland insect laboratory; Charles Speers of the New Haven, Connecticut insect laboratory; and Robert Furness and W. J. Buckhorn of the Portland insect lab. A base camp was established at the Tupper Guard Station about June 1st, with a projected start date for the project of June 15th. However, inclement weather and wet conditions pushed the start date back by several days, and only helicopters could be used initially because it was too wet to build a landing strip for the airplanes. The experimental area of 6,000 acres was divided into 15 plots of 350 acres each. Twelve of the plots were sprayed with a mixture of DDT and diesel oil. The

other three plots were left unsprayed as controls. The article mentions that natural parasites of budworm were also being studied, and that a polyhedral virus disease had been instrumental in controlling the tussock-moth outbreak near Troy. This article begins on the first page of the newspaper and three large photographs were also included on the front page (they show insecticide being applied by a helicopter, a defoliated stand, and a close-up of a budworm larva). On page 12, there is no text, but about 75% of the page is taken up with seven large photographs showing various aspects of the project (marking spray block boundaries, monitoring budworm larval development, monitoring larval kill, and operational details such as loading insecticide into helicopters.
Keywords: DDT/Heppner RD/Historical document/Insect control/Insect damage/Umatilla NF/Western spruce budworm/Douglas-fir tussock moth.

37. **Bergen, Joseph Y. 1906**. Elements of botany. Boston, MA: Ginn & Company. 199 p. **Size**: 5" x 8".
Notes: An original copy.
Abstract: This early work includes the following chapters: the seed and its germination; storage of food in the seed; movements, development, and morphology of the seedling; roots; plant cells; stems; structure of the stem; living parts of the stem; buds; leaves; ecology of leaves; minute structure of leaves; the study of typical flowers; the flower of the higher seed plants; true nature of floral organs; ecology of flowers and pollination; the study of typical fruits; the fruit; ecology of fruit and dispersal of fruits and seeds; the struggle for existence and the survival of the fittest; the classification of plants; types of cryptogams: thallophytes; types of cryptogams: bryophytes; types of cryptogams: pteridophytes; and general characteristics of cryptogams.
Keywords: Historical document/Botany/Plant identification/Vegetation classification.

38. **Berger, John M. 1962**. Forest statistics for Okanogan County, Washington. Forest Survey Report 139. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Exp. Station. 29 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1958-59, of Okanogan County, which was initially inventoried in 1935. The following topics were discussed: description of the county; significant findings in the forest inventory (land classification, commercial forest land area, commercial forest land timber volumes, forest ownership, log production); summary tables; forest survey procedure; accuracy of 1959 reinventory data; differences in results of inventories; definition of terms; and tree species. A map shows the location and distribution of forest cover types in the county (Douglas-fir, ponderosa pine, lodgepole pine, western larch, fir-spruce, hardwoods, noncommercial, nonforest). Fourteen tables of statistics are included.
Keywords: Okanogan County WA/Forest inventory/Eastern Washington/Colville Indian Reservation/Okanogan NF/Historical document/North Cascade Primitive Area.

39. **Bernstein, David A**. **1962**. Guide to two-story forest type mapping in the Douglas-fir subregion. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 6 p.
Notes: An original copy.
Abstract: Since most type mapping is based on aerial photos supplemented by field checking, stereograms are a relaible visual aid. This guide presents descriptions and stereograms of some of the major two-story types of the Douglas-fir subregion. It was designed to assist in mapmaking, and to improve forest managers' understanding of two-story types. The guide is divided into two parts: a discussion of the major two-story types, and a collection of stereograms accompanied by descriptions of their occurrence and photo indentification. Each pair contains a vertical view showing a two-story type on an aerial photo and a matching ground view looking into the stand.
Keywords: Historical document/Aerial photography/Forest types/Douglas-fir/Forest mapping.

40. **Bernstein, David A. 1960**. Using the master sample grid in continuous forest inventory; Oregon and Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. 5 p. **Notes**: An original copy.
Abstract: This short report discusses how to apply an inventory concept called the Master Sample Grid, which involves establishment of a systematic grid of equidistant points. The report describes the mechanics of laying out the plot grid and transferring points from maps to aerial photographs. The basic grid interval was 1.7 miles, and grid points were determined using 15-minute quadrangle maps. The following topics are discussed: base points; how the grid was plotted; present extent of the master sample grid; and transfer of points from map to photos.
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Master Sample Grid.

41. **Bingham, R. T.; Squillace, A. E. 1957**. Phenology and other features of the flowering of pines, with special reference to *Pinus monticola* Dougl. Research Paper 53. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 26 p. **Notes**: An original copy.
Abstract: In 45 young western white pine *(Pinus monticola)* trees where flowering was closely observed for periods up to 6 years, the following variables were studied: 1. low & high elevation; 2. pollen dissemination; 3. onset of flowering. This study was initiated as part of an extensive tree breeding project directed at development of western white pine sources that are resistant to white pine blister rust. The following phenological characteristics are reported and discussed as they relate to western white pine: time and duration of flowering period, consistency in sequence of flowering, year-to-year variation in the time of flowering, and time and overlap of periods of staminate and ovulate flowering.
Keywords: Genetics/Tree improvement/Western white pine/White pine blister rust/Historical document.

42. **Blake, Grover C. 1957**. Sowing the seed. Timberlines. 10 (May Memoirs): 1-33.
Notes: A photocopy of an original.
Abstract: This interesting memoir recounts experiences of the author while employed on national forests in the Blue and Ochoco Mountains of northeastern Oregon. Blake started on the Blue Mountains West National Forest in Prineville in 1909. His accounts began before that, when he worked as a stock tender in central Oregon, and end with his service on the Umatilla NF (Pomeroy RD) in the late 1920s.
Keywords: Blue Mountains Forest Reserve/Forest history/Deschutes NF/Historical document/Malheur NF/Northeastern Oregon/Ochoco NF/Umatilla NF/Pomeroy RD.

43. **Bloomberg, W. J. 1950**. Fire and spruce. Forestry Chronicle. 26 (2): 157-161. **Notes**: A photocopy of an original.
Abstract: One cannot but be impressed by the great age and stability of spruce-fir stands in the Canadian Rockies of southern Alberta. However, it is unclear how those stands will regenerate themselves since spruce seedlings are rare and fir, though proportionately greater than the final stand composition would warrant, was hardly profuse enough to fill in the gaps and sparse areas. This paper summarizes a study to examine why regeneration was sparse and how a climatic climax type perpetuates itself despite the lack of regeneration. The study area was near the Oldman River in southwestern Alberta in an area of high lightning risk. Mature stands consist of a spruce-balsam fir association that is generally well-stocked. On burns in the area, lodgepole pine regenerates thickly, stagnates at 150 years, and is gradually replaced by spruce. In appearance, the spruce stands resembled a typical, all-aged natural selection forest. But after analyzing age counts, it became clear that the age-class distribution was irregular: 0-50 years: nil; 51-100: nil; 101-150: 1%; 151-200: 12%; 201-250: 57%; 251-300: 25%; and 301-500: 5%. Further analysis of the two lowest age classes confirmed that small trees were old: 3.1-inch to 6.3-inch diameter trees ranged from 100 to 150 years old. Since the great majority of the trees were between 200 and 300 years of age, it could be argued that the whole area regenerated following some sort of stand-replacing disturbance, perhaps fire. That explanation would account for the irregular stand structure – 80% of the stand originated in a regeneration period following a disturbance, whereas the remainder resulted from reseeding within the established stand until some site factor or other phenomenon precluded further regeneration. After analyzing other stands at various points in natural succession, the author hypothesizes that the stands develop in this way: a mature or overmature stand experiences a moderate- or high-intensity fire, in which a few individuals may escape, probably mid-sized and mid-aged trees since young trees would be scorched by the fire and large, old trees would tend to suffer windthrow after the surrounding stand is killed. As a result of the fire, a young, dense pine stand gets established. After the pine has modified the site to some degree, an exceptionally good seed year will result in spruce getting established under the pine stand. The spruce gets established in a comparatively short period but is not very dense owing to the limited number of seed trees. As soils and the litter and duff layers recover from the original fire, the spruce is able to continue seeding in and a second wave of spruce regeneration is often able to get established, resulting in this chronosequence: 1st generation spruce with an age of 210 years; 1st generation pine with an age of 70 years (resulting from fire that wiped out most of the original spruce stand); 1st wave of 2nd generation spruce with an age of 65 years; and 2nd wave of 2nd generation spruce with an age of 48 years. Further development on these sites in the absence of disturbance results in a gradual senescence of spruce and the eventual invasion and establishment of fir. In stands where all of the mature spruce were killed by a fire, a dense pine stand resulted. In some instances, spruce regeneration was also present, but only when a seed source from marginal (unburned) stands was within 300 feet of the burn. As the spruce stand matures, a thick humus layer accumulates on the forest floor and the establishment of spruce seedlings is eventually inhibited because the seedling's radicle is unable to penetrate deep enough to reach mineral soil. Fir seedlings, however, are able to penetrate the humus layer more easily and gradually comprise all of the regeneration on an undisturbed site. Although this successional progression would seem to lead to pure stands of the climax species – balsam fir – after two or more generations without fire, no examples of that condition could be found in the study area. The reason was thought to relate to the longevity of spruce, since 500-year old individu-

als were not uncommonly encountered during the increment boring exercise that was used to establish age classes, and that it was virtually impossible to reach a climax stage when the long-lived seral dominant (spruce) was capable of surviving much longer than any possible fire-free interval in an area with high lightning risk. Therefore, the author concludes that fire had a positive and causative effect on the establishment of spruce as a "climax" type. His closing statement is: "it may not be too fantastic to consider the day when we shall wonder whether fire, in some form at least, has not been a friend masquerading as a foe."
Keywords: Climax vegetation/Fire ecology/Forest ecology/Historical document/Plant succession/Spruce-fir forests/Alberta.

44. **Boerker, R. H. 1916**. A historical study of forest ecology; its development in the fields of botany and forestry. Forestry Quarterly. 14: 380-432. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This long article provides a history of forest ecology in North America, including the influence of European forestry on its development. The following topics are discussed: the historical development of plant ecology; the historical development of silviculture; and a summary.
Keywords: Historical document/Forest history/Forest ecology/Silvicultural systems/European forestry.

45. **Boerker, Richard H. Douai**. **1920**. Our national forests; a short popular account of the work of the United States Forest Service on the national forests. New York, NY: The Macmillan Company. 238 p. **Size**: 6" x 8".
Notes: An original copy. This book was originally published in September, 1918; this version is a reprint published in 1920.
Abstract: This comprehensive book includes the following chapters: introduction (forestry as a national problem, the extent and character of our national forests, why the national forests were created, how the national forest policy has benefitted the people); the creation and organization of the national forests; the administration of the national forests; the protection of the national forests; the sale and rental of national forest resources; and an appendix. This book includes many high-quality black-and-white photographs.
Keywords: Forest administration/Forest organization/Forestry extension information/Historical document/National forests/U.S. Forest Service history.

46. **Bolles, W. H. 1936**. Forest statistics for Chelan County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 13 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Chelan County's forests in 1934-1935. A small-scale map showing the distribution of forests and nonforest areas is also included. The following topics are discussed: location and description of the county; agriculture and other land uses; the forests; forest ownership; forest types; productive capacity of forest land; drought and insects; volume of merchantable timber; forest industries; the place of forests in the everyday life of the people; and summary. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Chelan County WA/Forest inventory/Historical document/Chelan NF/Wenatchee NF.

47. **Bones, James T.; Hightree, Paul E. 1958**. Forest statistics for Baker and Malheur Counties, Oregon. Forest Survey Report 132. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 43 p. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1956, of Baker and Malheur Counties, which were initially inventoried in 1936 and 1937. The following topics were discussed: description of the counties; significant findings of the forest inventory (land classification, commercial forest land area, commercial forest land timber volume, forest ownership, forest utilization); summary tables; forest survey procedure; accuracy of the 1956 reinventory data; differences in results of inventories (1936-37 to 1956); and definition of terms. A map shows the location and distribution of forest stand-size and condition classes in the two counties. Twenty-five tables of statistics are included.
Keywords: Forest inventory/Baker County OR/Malheur County OR/Eastern Oregon/Malheur NF/Wallowa-Whitman NF/Historical document.

48. **Bones, James T.; Schimel, Richard D. 1960**. Forest statistics for Wallowa County, Oregon. Forest Survey Report 134. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 30 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1957, of Wallowa County, which was initially inventoried in 1935-1936. The following topics were discussed: description of the county; significant findings of the forest inventory (land classification, commercial forest land area, commercial forest land timber volumes, forest ownership, log production); summary tables; forest survey procedure; accuracy of 1957 reinventory data; differences in results of inventories (1935-36 to 1957); definition of terms; and tree species. A generalized forest type map shows the location and distribution of forest types in the county. Fourteen tables of statistics are included.
Keywords: Forest inventory/Historical document/Eastern Oregon/Wallowa County OR/Umatilla NF/Wallowa-Whitman NF.

49. **Bones, James T.; Simonson, James E. 1960**. Forest statistics for southeast Washington. Forest Survey Report 136. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 40 p. **Notes**: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1957, of Asotin, Columbia, Garfield, and Walla Walla Counties, which were initially inventoried in 1935. The following topics were discussed: significant findings of the forest inventory; description of the counties; forest resource (forest land area; commercial forest land area, commercial forest land timber volume, forest ownership, log production); forest survey procedure; accuracy of 1957 reinventory data; differences in results of inventories (1936 to 1957); definition of terms; and tree species. A generalized forest type map shows the location and distribution of forest types in the four counties. Twenty-three tables of statistics are included.
Keywords: Forest inventory/Historical document/Southeastern Washington/Asotin County WA/Columbia County WA/Garfield County WA/Walla Walla County WA/Umatilla NF.

50. **Bourdo, Eric A., Jr. 1956**. A review of the General Land Office survey and of its use in quantitative studies of former forests. Ecology. 37 (4 (August)): 754-768. **Notes**: A photocopy from an original.
Abstract: For a variety of reasons, there has been much interest in reconstructing the general characteristics and distribution of vegetation as it existed before settlement by Euro-American emigrants. The information sources for completing such analyses are limited. Of the historic sources, land surveyor's records have been commonly used since they are available for most of the continental United States. In general, investigators have sought two types of information from the land survey records: qualitative data suitable for constructing maps of presettlement vegetation types, and quantitative data concerning the spatial arrangement and size class distribution of the trees within forested areas. The species and diameters of the recorded trees, in combination with their distance and direction from the section corner or from each other, allows a crude analysis of forest composition and structure. The author goes on to describe how land survey notes, in combination with other data sources, were used to reconstruct presettlement vegetation conditions for a large area in the Upper Peninsula of Michigan.
Keywords: Forest history/GLO survey notes/Historical document/Presettlement vegetation/Michigan.

51. **Bourne, E. G. 1901**. The legend of Marcus Whitman. American Historical Review. 6 (January): 276-300.
Notes: A photocopy of an original.
Abstract: This article describes the "true story" of how Marcus Whitman saved Oregon for the United States. The account begins with the arrival of a colony of Canadians at Fort Walla Walla, a Hudson's Bay Company trading post, in October of 1842. Since Whitman realized that an American emigration must occur if America was to establish a claim to the Oregon country, he left for Washington to alert the authorities about the Canadian immigration. He arrived there in March of 1843 and convinced officials that the country could be settled by agreeing to lead a thousand emigrants to Oregon, which he does during the ensuing summer. The balance of the article describes the 1843 emigration, ensuing events involving Whitman, and other related matters. Although this article lacks descriptions of vegetation conditions, it does provide a good historical account of an important era in the settling of the northern Blue Mountains and interior Columbia Basin.
Keywords: Blue Mountains/Southeastern Washington/Historical document/Marcus Whitman/Whitman Trail/

Whitman Mission/Washington history.

52. **Boyce, J. S. 1923**. The deterioration of felled western yellow pine on insect-control projects. Bulletin No. 1140. Washington, DC: U.S. Department of Agriculture. 7 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Describes a study to determine the deterioration rate associated with ponderosa pines killed by western pine beetle in southern Oregon and northern California. Logging operations lagged behind falling operations, so it was necessary to leave trees on the ground for several years. Deterioration was found to increase steadily from the second year on, with little merchantable volume remaining seven years after cutting. Deterioration was caused by many factors, including checks, saprot, heartrot, falling breaks, burning, and wood borers.
Keywords: Ponderosa pine/Timber defects/Oregon/California/Western pine beetle/Historical document.

53. **Boyd, George R. 1941**. Clearing land of brush and stumps. Farmers' Bulletin 1526. Washington, DC: U.S. Department of Agriculture. 35 p. **Size**: 6" x 9". **Notes**: An original copy. Originally issued in May, 1927 and initially revised in June, 1929. This revision is dated April, 1941.
Abstract: On many farms there are small tracts on which only brush or inferior timber is growing which would be more productive if cleared and devoted to the growing of cultivated crops. Also many cultivated fields still contain large stumps which impede farm operations and add to the cost of crop production. The removal of brush, trees, and stumps and the preparation of the ground for crops are at best laborious tasks, but the labor in many cases can be greatly reduced if proper tools and methods are employed. The method which succeeds best under one set of conditions may be wholly unsuited to other conditions. This bulletin describes the methods followed in different localities and points out the conditions under which their use is warranted. It does not attempt to advocate one method as superior to any other, for each has been found satisfactory under the conditions to which it is adapted. This bulletin supersedes Farmers' Bulletin 974.
Keywords: Brush clearing/Farm forests/Forestry extension information/Historical document/Stump removal/Land clearing.

54. **Bridgwater, David R. 1984**. Biological assessment of 1983 western spruce budworm suppression project. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Forest Pest Management. 23 p. **Notes**: A photocopy of an original.
Abstract: The first indication of an impending western spruce budworm outbreak was 2,300 acres of defoliation on the annual aerial detection survey in 1980. By the 1981 detection survey, the acreage of visible defoliation had increased to 310,000 acres, prompting Forest Pest Management, National Forest, and State personnel to initiate an environmental analysis of the situation. The analysis indicated that 200,000 acres of defoliated area qualified for direct treatment using insecticides. Due to budget constraints, only 178,000 acres of that total were actually treated in the spring of 1982. The aerial detection survey of 1982 indicated that budworm-caused defoliation had increased to over 1.5 million acres, necessitating another environmental analysis effort in 1982-1983. That environmental assessment proposed insecticide treatment on approximately 1.4 million acres of budworm host type on the Umatilla, Ochoco, Wallowa-Whitman, and Malheur National Forests and adjacent BLM, State, and private lands. During June and July of 1983, a total of 524,561 acres were treated with carbaryl, mexacarbate, or *Bacillus thuringiensis*, a bacterial agent. This report describes the results of the treatment projects on western spruce budworm populations. It contains the following sections: introduction; project area; sampling design and procedures (larval development and density, and prespray and postspray treatment larval population (operational project and evaluation of B.t. and mexacarbate)); insecticide application; results (larval development and density, and prespray and postspray larval population); discussion (larval development, and larval population density); acknowledgements; and literature cited. The report includes 15 pages of maps (½" to the mile), showing the location of treatment units. Of the 17 treatment areas, five occurred wholly or partially on the Umatilla NF (Miller Prairie 1 and 2, Putney Mountain, Matlock, and Pearson).
Keywords: Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Insect control/Chemical insecticides/Malheur NF/Bacillus thuringiensis/Carbaryl/Mexacarbate.

55. **Briegleb, Philip A. 1940**. Forest growth in the ponderosa pine region of Oregon and Washington. Forest Survey Report 78. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 51 p. **Notes**: A photocopy of an original.
Abstract: This report summarizes results of the growth phase of the forest surveys conducted in the ponderosa pine region of eastern Oregon and eastern Washington. The surveys were completed between 1934 and 1936. The following topics are discussed: introduction; kinds of growth calculation made (standards of measurement, source of growth rates used); current annual growth (gross and net); periodic growth, including prospective growth trends;

potential annual growth; comparison of current and potential growth; and summary of sawtimber growth. Appendix material describes a gross growth study in virgin stands; provides a new chart for making site and structure corrections; and describes a method for making mortality estimates. Twenty tables and 10 figures of statistics are also provided.
Keywords: Forest inventory/Eastern Oregon/Eastern Washington/Ponderosa pine/Historical document.

56. **Briegleb, Philip A. 1937**. Forest statistics for Okanogan County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 15 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Okanogan County's forests in 1935. A small-scale map showing the distribution of forests and nonforest areas is also included. The following topics are discussed: location and description of county; the nonforest land; the forests; productive capacity of forest land; saw-timber volume; and economic development. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Okanogan County WA/Forest inventory/Historical document/Chelan NF/Colville NF/Colville Indian Reservation.

57. **Briegleb, Philip A. 1943**. Growth of ponderosa pine by Keen tree class. Forest Research Note No. 23. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 15 p.
Notes: An original copy.
Abstract: Virgin stands of ponderosa pine exhibited a tremendous range in tree size, quality, age, and thrift. Often, the variation was so great as to render stand averages meaningless. In order to provide a practical basis for estimating the mortality probabilities and growth potentials of individual ponderosa pine trees, the Keen tree classification was developed in the mid 1930s. Under the Keen system, individual trees were grouped into a 16-cell matrix consisting of four age classes (young, immature, mature, and overmature) and four crown vigor classes (full vigor, good to fair vigor, fair to poor vigor, and very poor vigor). The Keen system was widely used in the ponderosa pine forests of Oregon and Washington – variants of this system were also developed for ponderosa pine forests in the Black Hills of South Dakota and northeastern Wyoming, and the southwestern United States (Arizona and New Mexico). This report summarizes virgin stand growth rates by Keen tree class. It was based on increment core growth measurements from almost 8,000 trees located on thirty 10-acre permanent sample plots established in eastern and central Oregon by the Portland Forest Insect Laboratory, Bureau of Entomology and Plant Quarantine.
Keywords: Historical document/Tree growth/Stand growth/Keen classification system/Ponderosa pine/Eastern Oregon.

58. **Bright, G. A. 1912**. A study of the growth of yellow pine in Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 106 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: During 1910 and 1911, an extensive study of western yellow pine was conducted throughout its range in Oregon. This report, a compilation of the growth and yield data from that study, was based on a very large number of measurements. The report was not intended for publication in this form, but was prepared as an office report to summarize and tabulate the growth data that had been collected to that point. The data from this and other office reports was eventually used to prepare an important and influential government bulletin called "Western yellow pine in Oregon" (see Munger 1917 for more information). It includes many interesting conclusions, including the fact that young trees were growing at the same rate as the old trees did when they were young, demonstrating that virgin yellow pine forests developed under similar structural and density regimes as the sampled stands. The report also describes an interesting crown space study in which it was attempted to show that a tree's growth rate increases in direct proportion to the amount of available growing space. The report includes the following sections: organization of party; region covered; tracts; occurrence of yellow pine; region of gravelly or sandy soils; region of decomposed lava soils; comparison of diameter growth for the various tracts; the Lapine first, Lapine second, and Deschutes River diameter growth tables; Fort Klamath growth tables; the Bend growth tables; the Sisters first and Sisters second growth tables; the Odessa growth tables; the Embody growth tables; the Whitney and Austin growth tables; Palmer Junction growth tables; Parker's Mill and Winlock growth tables; the Ochoco Creek growth tables; Mill Creek growth tables; the Metolius Creek growth tables; the Meadow Lake and Keno growth tables; the Tamarack Creek growth tables; the Crystal Creek growth tables; present and past rate of diameter growth of yellow pine by age classes; increased growth due to unnatural causes; seedling height growth; mean and current annual height

growth; volume growth; types of yellow pine forest (south slope, north slope, flat or bench, juniper, and canyon); factors affecting growth (altitude, soil, aspect, slope, competition with other trees); and summary. This accession also includes three memoranda that are related to the study or the report: a 3-pager dated April 27, 1912 from the Acting District (Regional) Forester to the Forester (Chief) in Washington; a 5-pager dated April 29, 1912 from the Assistant District Forester to a Forest Supervisor; and a 1-pager to the District Forester from the Assistant Forester (Chief) in Washington. In the short memo from the Washington Office, the District Forester is encouraged to consider conversion of many of the uneven-aged stands of ponderosa pine to an even-aged structure, in light of the species' intolerance.
Keywords: Historical document/Blue Mountains/Diameter growth/Eastern Oregon/Forest management/Height growth/Ochoco NF/Malheur NF/Ponderosa pine/Selection cutting/Timber yields/Uneven-aged management/ Volume tables/Wallowa-Whitman NF.

59. **Bright, George A. 1911**. Annual silvical report. Unpublished Typescript Report. Heppner, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 17 p.
Notes: A digital version of this report is available; filename: Whitman1. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes a study to determine the important factors affecting western yellow (ponderosa) pine regeneration. The material for this report was gathered during the summer of 1910 on the Whitman National Forest, where the reproduction of western yellow pine was excellent over most of the area. Bright found that partial shade and protection from sun and wind is beneficial to very young seedlings. Optimum growth of western yellow pine was found on transition (mixed conifer) sites, where Bright measured mature trees from 150 to 177 feet tall. Bright recommended that regeneration cutting occur during winter after a good seed year, and that slash be lopped and scattered, rather than burned, so it could provide protection for seedlings. The surest method of artificial reproduction was to plant 2 or 3-year old nursery stock, especially on steep south or west slopes. Bright found sheep grazing to be beneficial to regeneration as a site preparation and vegetation control measure, although overgrazing was detrimental. The report includes numerous tables showing the results of sample plots. Bright recommends that 435 surviving seedlings are needed to assure stand establishment, and his plots indicate that 62,000 seeds would be needed to assure that 435 seedlings are established, per acre.
Keywords: Natural regeneration/Ponderosa pine/Whitman NF/Umatilla NF/Blue Mountains/Historical document.

60. **Bright, George A. 1922**. Cost report; Silvies River timber survey. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 5 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short report is an enumeration of the costs incurred on a timber survey project for the Silvies River area on the Bear Valley Ranger District of the Malheur National Forest. It summarizes costs in the following sections: field work (control, strip cruising, camp map compilation, supervision by chief, travel, miscellaneous work, rain, sundays and holidays, and sick leave); office work (topographic map, estimate maps, type maps, report, blue printing, and typing); and total costs. This report shows a total cost of $4,023.60, with all but $466.07 of that cost being tied to the field work. Since 71,944 acres were included in the survey area, this represented a cost per acre of $0.0559. The timber cruised during the survey was 1,040,597,000 board feet, which meant the cost per MBF was $0.0039. Note that the history archives does not have a copy of the descriptive report for this project, as it was not found at the National Archives.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Malheur NF/Silvies River/Bear Valley RD.

61. **Bright, George A. 1914**. The extensive reconnaissance of the Wenaha National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 84 p. **Notes**: This report, including the photographs, was reprinted in 1994 by the Umatilla National Forest (see Bright and Powell 1994).
Abstract: This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map is included showing the Forest's boundaries, the stream and river patterns, and the location where each photograph was taken. [In the 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] Bright provides interesting insights, as illustrated with these quotes: "Mistletoe, it is thought, is on the increase. It is killing many Douglas fir. Nearly every large or medium-sized Douglas fir will often be found to be infested with this disease, on certain north slopes. There is very little bark-beetle infestation among the yellow pine, probably accounted for in part by the fact that the stands of this species are all small and isolated." "White pine was at one time distributed over the entire Forest but it was killed out by fires, to which it is so particu-

larly susceptible, years ago. It is thought that white pine would be an excellent tree to plant on all the burns found on the higher altitudes of the Wenaha. It attains good size and form in such places, and its wood is superior to any of the other species with which it occurs in such places." "Those settlers living near the breaks of the Wenaha River and Crooked Fork haul the logs to the edge and shove them over the breaks. Timber is the worst enemy the people have in this region, and clearing the ground is their most difficult problem. It is most unfortunate that this timber must be so ruthlessly destroyed, as it is the best body of timber within the Wenaha Forest."
Keywords: Historical document/Forest history/Range management/Forest management/Wildlife management/Fire effects/Western white pine/Blue Mountains/Wenaha NF/Umatilla NF/Rimrock.

62. **Bright, George A. 1913**. Plate IV, looking down Meacham Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Meacham Creek. **Size**: 3" x 5¼". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 9 of George A. Bright's "Wenaha - Reconnaisance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This photograph was one of two on a page; the caption beneath them was "These two photographs illustrate the difference between the creek canyons in the northern and southern parts of the Forest. Those in the northern part, as in the case of Asotin Creek, being much steeper and rougher that in the southern part, where Meacham Creek is a typical example."
Keywords: Umatilla NF/Meacham Creek/Historical photograph/Walla Walla RD/Wenaha NF.

63. **Bright, George A. 1913**. Plate V, looking down Asotin Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Asotin Creek. **Size**: 3" x 5¼". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 9 of George A. Bright's "Wenaha - Reconnaisance Extensive Report" (see Bright 1914). This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This photograph was one of two on a page; the caption beneath them was "These two photographs illustrate the difference between the creek canyons in the northern and southern parts of the Forest. Those in the northern part, as in the case of Asotin Creek, being much steeper and rougher that in the southern part, where Meacham Creek is a typical example."
Keywords: Umatilla NF/Asotin Creek/Historical photograph/Pomeroy RD/Wenaha NF.

64. **Bright, George A. 1913**. Plate VI, looking toward Saddle Butte. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Saddle Butte. **Size**: 3½" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 11 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "Looking toward Saddle Butte, one of the highest points on the Wenaha, showing the summit crowned with timber. No part of the Wenaha is above timber line, or too high for the full development of two or three commercially valuable species. Neither is any part of it too low for the growth of commercial pine and fir."
Keywords: Historical photograph/Saddle Butte/Wenaha NF/Pomeroy RD.

65. **Bright, George A. 1913**. Plate VII, the Caraway place. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3½" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 13 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the For-

est, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "The Caraway Place, homesteaded and later abandoned. The 160 acres comprised in this place can be bought for five hundred dollars on easy terms. It finds no purchaser, although worse places are continually being applied for on the National Forest under the Act of June 11, 1906."
Keywords: Historical photograph/Wenaha NF/Pomeroy RD/Caraway homestead.

66. **Bright, George A. 1913**. Plate VIII, snow banks lying in the open. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3½" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 15 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "Snow banks lying in the open, June 10, 1913, in one of the higher portions of the Wenaha. Late lying snow banks are a great equalizer of stream flow. Beneath the shelter of trees snow covered the ground last year till well through the month of July."
Keywords: Historical photograph/Wenaha NF/Pomeroy RD/Watershed management.

67. **Bright, George A. 1913**. Plate X, pure stand of yellow pine on a gentle south slope on the Wenaha. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Section 7, T. 5 N., R. 41 E., W. M. [app.]. **Size**: 3½" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 20 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "Pure stand of yellow pine on a gentle south slope on the Wenaha. Such stands are rare on this Forest and of small extent. Located approximately in section 7, T. 5 N., R. 41 E., W. M." Someone (possibly Irving Smith, Pomerory District Ranger in 1962-1968) wrote on the original copy of the report that this photograph may have been taken near Eden Bench.
Keywords: Ponderosa pine/Historical photograph/Wenaha NF/Pomeroy RD/Eden Bench.

68. **Bright, George A. 1913**. Plate XIII, looking across a frequently and badly burned area. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 4, T. 4 N., R. 40 E., W. M. **Size**: 3" x 5".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 24 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "Looking across a frequently and badly burned area in sec. 4, T. 4 N., R. 40 E., W. M., in the transition type."
Keywords: Fire effects/Historical photograph/Wenaha NF/Pomeroy RD/Forest fires.

69. **Bright, George A. 1913**. Plate XIX, Fry Meadows. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality:** Brock Meadows. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 31 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the For-

est, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] Someone (possibly Irving Smith, Pomerory District Ranger in 1962-1968) crossed out the word "Fry" on the original report and wrote in the work "Brock." The caption shown beneath it in the reconnaissance report was "Fry Meadows. These meadows are usually found in the transition type, streams frequently heading in them. They are old lake beds which have slowly filled in. The soil is too wet for trees but favorable to the growth of soft grasses yielding excellent summer pasturage."
Keywords: Historical photograph/Fry Meadows/Wenaha NF/Walla Walla RD/Brock Meadows.

70. **Bright, George A. 1913**. Plate XL, young trees. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 76 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "The trees in this picture are all young trees, mostly seedlings, saplings, or poles, and are covering slopes which a comparatively few years ago must have been bare. The stoppage of fire since the introduction of grazing has done much to make these trees possible, coupled with the protection in recent years of the Forest Service."
Keywords: Fire ecology/Natural regeneration/Historical photograph/Wenaha NF/Pomeroy RD/Forest ecology/Livestock grazing.

71. **Bright, George A. 1913**. Plate XLI, Grande Ronde River at Palmer Junction. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Palmer Junction. **Size**: 3" x 5¼". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 77 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "The Grande Ronde River at Palmer Junction. Part of this river flows through the Wenaha National Forest from which it also receives many of its most important tributaries, among them the Wenaha River."
Keywords: Grande Ronde River/Palmer Junction/Watershed management/Historical photograph/Wenaha NF/Pomeroy RD.

72. **Bright, George A. 1913**. Plate XLII, largest body of timber on the Wenaha. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Summer Creek, T. 4 N., R. 39 E. **Size**: 3" x 5¼".
Notes: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 78 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath it in the reconnaissance report was "Part of the largest body of timber on the Wenaha. The country is tributary to Summer Creek, T. 4 N., R. 39 E. Species are mostly the firs, lodgepole, and spruce."
Keywords: Forest types/Historical photograph/Wenaha NF/Pomeroy RD/Summer Creek.

73. **Bright, George A. 1913**. Plate XV, typical burns in the transition type on the Wenaha. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5¾".
Notes: An original copy.

Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 26 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This photograph was one of two shown on a page; the caption beneath them in the reconnaissance report was "These photographs show typical burns in the transition type on the Wenaha. This type of forest suffers more than any other from fire because of the small size of the trees, their thin bark, and the closeness with which they are usually found growing together."
Keywords: Fire effects/Historical photograph/Wenaha NF/Pomeroy RD/Forest types/Transition type.

74. **Bright, George A. 1913**. Plate XVI, typical burns in the transition type on the Wenaha. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5¾".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 26 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This photograph was one of two on a page; the caption shown beneath them in the reconnaissance report was "These photographs show typical burns in the transition type on the Wenaha. This type of forest suffers more than any other from fire because of the small size of the trees, their thin bark, and the closeness with which they are usually found growing together."
Keywords: Fire effects/Umatilla NF/Historical photograph/Pomeroy RD/Wenaha NF/Forest types/Transition type.

75. **Bright, George A. 1913**. Plate XVII, typical creek bottom on the Umatilla River. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Near Bingham Springs and Corporation Ranger Station. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 29 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This photograph was one of two on a page; the caption shown beneath them in the reconnaissance report was "Two views of typical creek bottoms on the Umatilla River near Bingham Springs and Corporation Ranger Station, where black cottonwood forms the principal species."
Keywords: Black cottonwood/Umatilla River/Umatilla NF/Historical photograph/Walla Walla RD/Wenaha NF/Bingham Springs/Corporation Ranger Station.

76. **Bright, George A. 1913**. Plate XVIII, typical creek bottom on the Umatilla River. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Near Bingham Springs and Corporation Ranger Station. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 29 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This photograph is one of two on a page; the caption shown beneath them in the reconnaissance report was "Two views of typical creek bottoms on the Umatilla River near Bingham Springs and Corporation Ranger Station, where black cottonwood forms the principal species."
Keywords: Black cottonwood/Umatilla River/Umatilla NF/Historical photograph/Walla Walla RD/Wenaha NF/Bingham Springs/Corporation Ranger Station.

77. **Bright, George A. 1913**. Plate XXI, Elk Flat. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 5, T. 5 N., R. 41 E., W. M. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 33 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Elk Flat. A typical meadow in Sec. 5, T. 5 N., R. 41 E., W. M. Note the large size and abundance of quaking aspen."
Keywords: Meadows/Quaking aspen/Umatilla NF/Historical photograph/Walla Walla RD/Wenaha NF/Elk Flat.

78. **Bright, George A. 1913**. Plate XXII, topography and general appearance of the Three Forks country. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 6 and 7 N., R. 40, 41, and 42 E. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 35 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Topography and general appearance of the Three Forks country of the north-central portions of the Forest, especially in T. 6 and 7 N., R. 40, 41, and 42 E. Steepness of the ridges very much minimized by the photograph. Timber consists of very scattered and stunted Douglas fir and juniper. Practically no reproduction."
Keywords: Umatilla NF/Historical photograph/Pomeroy RD/Wenaha NF/Rocky Mountain Douglas-fir/Western juniper/Natural regeneration/Forest ecology/Three Forks.

79. **Bright, George A. 1913**. Plate XXIII, looking up Butte Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Butte Creek. **Size**: 3" x 5¼". **Notes**: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 36 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Looking up Butte Creek. The timber is mostly very scattered small Douglas fir."
Keywords: Umatilla NF/Historical photograph/Pomeroy RD/Wenaha NF/Rocky Mountain Douglas-fir/Forest types/Butte Creek.

80. **Bright, George A. 1913**. Plate XXIV, the Crooked Fork country. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Crooked Fork. **Size**: 3" x 5¼". **Notes**: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 36 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "The Crooked Fork country."
Keywords: Umatilla NF/Historical photograph/Pomeroy RD/Wenaha NF/Crooked Fork.

81. **Bright, George A. 1913**. Plate XXV, Asotin Creek. U.S. Department of Agriculture, Forest Service, Umatilla Na-

tional Forest. **Locality**: Asotin Creek. **Size**: 3½" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 38 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Asotin Creek. This illustrates the typical canyon walls of the northern portion of the Forest near the boundary. This canyon is 2,000 feet deep at least, and the distance from the top to the creek bottom is covered by breaks alternating with loose slides of rock and soil. A few Douglas fir cling to the steep sides in places. In the narrow creek bottom are a few fir and yellow pine. Reproduction on the sides of the canyon practically nil because of steepness of slopes."
Keywords: Umatilla NF/Historical photograph/Pomeroy RD/Wenaha NF/Rocky Mountain Douglas-fir/Natural regeneration/Forest ecology/Ponderosa pine/Asotin Creek.

82. **Bright, George A. 1913**. Plate XXVII, looking across from one side of Meacham Creek to the other. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Meacham Creek. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 41 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Looking across from one side of Meacham Creek to the other, showing reproduction as slightly darkened strips following along the bottoms of the secondary canyons and swales. View taken two or three miles inside Forest boundary. Large trees are almost lacking."
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Wenaha NF/Natural regeneration/Forest ecology/Meacham Creek.

83. **Bright, George A. 1913**. Plate XXVIII, a burn in the transition type. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 10, T. 4 N., R. 40 E. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 53 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "A burn in the transition type in Sec. 10, T. 4 N., R. 40 E., where it is believed western white pine could be planted to good advantage. Topography undulating and in general clearer of reproduction than appears in the photograph."
Keywords: Umatilla NF/Historical photograph/Pomeroy RD/Wenaha NF/Natural regeneration/Forest ecology/Transition type/Western white pine.

84. **Bright, George A. 1913**. Plate XXXIX, looking down Bobsled Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Bobsled Creek. **Size**: 3¼" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 75 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Looking down Bobsled Creek in foreground, showing timber starting up in secondary draws. The Umatilla River lies in the big canyon in the background."

Keywords: Bobsled Creek/Umatilla NF/Historical photograph/Walla Walla RD/Wenaha NF/Natural regeneration/ Forest ecology/Umatilla River.

85. **Bright, George A. 1913**. Plate XXXV, elk on the Wenaha. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5". **Notes**: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 71 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Elk on the Wenaha – taken at 100 feet in early morning."
Keywords: Wildlife management/Umatilla NF/Historical photograph/Wenaha NF/Elk.

86. **Bright, George A. 1913**. Plate XXXVI, elk on the Wenaha. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5". **Notes**: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 71 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Elk on the Wenaha – taken at 100 feet in early morning."
Keywords: Wildlife management/Umatilla NF/Historical photograph/Wenaha NF/Elk.

87. **Bright, George A. 1913**. Plate XXXVII, glades along the sides of the Umatilla River. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 74 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This is one of two photographs on a page; the caption shown beneath them in the reconnaissance report was "Two views showing typical so-called "glades" along the top of the sides of the Umatilla River. These glades are typical of the main streams in that part of the Wenaha in Oregon. These glades permit open travel through an otherwise almost inaccessible country."
Keywords: Glades/Umatilla NF/Historical photograph/Wenaha NF/Meadows/Umatilla River/Walla Walla RD.

88. **Bright, George A. 1913**. Plate XXXVIII, glades along the sides of the Umatilla River. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3¼" x 5½".
Notes: An original copy.
Abstract: The quality of this black and white print is poor; although the focus is adequate, contrast is poor and it is difficult to distinguish changes in vegetation conditions. It was contained on page 74 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] This is one of two photographs on a page; the caption shown beneath them in the reconnaissance report was "Two views showing typical so-called "glades" along the top of the sides of the Umatilla River. These glades are typical of the main streams in that part of the Wenaha lying in Oregon. These glades permit open travel through an otherwise almost inaccessible country.".

Keywords: Glades/Umatilla NF/Historical photograph/Wenaha NF/Meadows/Umatilla River/Walla Walla RD.

89. **Bright, George A. 1917**. Table showing area covered by intensive timber surveys in District VI. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 2 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short accession consists of a two-page table entitled "Table showing area covered by intensive timber surveys, District VI." It includes the following information for each of 22 national forests in the North Pacific District of the Forest Service: net area of national forest (acres); net area in commercial timber zone (acres); net area covered by timber surveys (acres); percent of net area covered by timber surveys; and percent of net commercial timber zone covered. The table shows that the Umatilla NF had 486,183 acres of net national forest land; 309,982 net acres in the commercial timber zone; and 0 net acres covered by timber surveys, which represented 0% of the net forest area and 0% of the commercial timber zone acreage. The Wenaha NF (now the northern half of the Umatilla NF) had 738,938 acres of net national forest land; 356,569 net acres in the commercial timber zone; and 43,600 net acres covered by timber surveys, which represented 5.9% of the net forest area and 12.2% of the commercial timber zone acreage.
Keywords: Forest inventory/Historical document/Umatilla NF/Pacific Northwest Region/Wenaha NF.

90. **Bright, George A. 1913**. Umatilla National Forest annual silvical report: relative merits of western larch and Douglas fir in the Blue Mountains, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 16 p.
Notes: A digital version of this report is available; filename: Umatilla1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report deals with Douglas-fir and western larch as they occur in the Blue Mountains of northeastern Oregon, especially on the Umatilla and Whitman National Forests. In that locality, they are the two species that were next in commercial importance to western yellow (ponderosa) pine. Both western larch and Douglas-fir had very little commercial use at the time this report was written – the reason was not that the wood of those species was bad, but that the wood of yellow pine, which was abundant, is exceptionally good in quality. The report also includes the following topics: technical qualities of larch, faults of larch wood, longevity of larch, natural enemies of larch, management of larch, technical qualities of Douglas-fir, forest types in which Douglas-fir is found, resistance of Douglas-fir to insects and diseases, management of Douglas-fir, growth and yield of Douglas-fir and western larch trees and stands, and a summary.
Keywords: Douglas-fir/Western larch/Blue Mountains/Umatilla NF/Whitman NF/Historical document/Wood characteristics/Wallowa-Whitman NF.

91. **Bright, George A.; Powell, David C. 1994**. An extensive reconnaissance of the Wenaha National Forest in 1913. Technical Publication F14-SO-08-94. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Umatilla National Forest. 56 p. **Notes**: A digital version of this report is available; filename: Wenaha. Recreates a document originally published in 1914.
Abstract: This document recreates an historically valuable report prepared by George A. Bright in 1914. It describes an extensive reconnaissance of the Wenaha National Forest that Bright completed in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. Additional historical photographs of the Wenaha National Forest were included by the editor (David C. Powell) in an appendix. The original report is reproduced in its entirety, with occasional comments added by the editor.
Keywords: Historical document/Forest history/Range management/Forest management/Wildlife management/Fire effects/Western white pine/Blue Mountains/Wenaha NF/Umatilla NF.

92. **Browne, F. L. 1942**. Classification of house and barn paints. Technical Bulletin No. 804. Washington, DC: U.S. Department of Agriculture. 36 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in January, 1942.
Abstract: There is an enormous quantity of paint used on wooden farm buildings. The variety and complexity of the paints on the market, and the inability of ordinary users to understand paint composition statements printed on container labels, led to a USDA effort to develop a classification system that categorizes paints by groups, types, and grades. This bulletin describes the classification system. If adopted by paint manufacturers, it would simplify the technical information found on paint-can labels, and would tell paint users more clearly how to identify the many kinds of paint on the market, what the characteristics of each paint are, and how each should be applied and maintained. The bulletin includes the following sections: introduction; calculating classification from paint formulas; summary; and literature cited.
Keywords: House paints/Historical document.

93. **Browne, F. L. 1930**. Why some wood surfaces hold paint longer than others. Leaflet No. 62. Washington, DC: U.S. Department of Agriculture. 4 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in September, 1930.
Abstract: The impression had long been that exterior house paints must be selected based on the kind of wood to be coated. Experimental evidence suggests that prevailing recommendations geared toward painting exterior softwoods were unnecessarily complicated. The choice of a primer paint does not need to be modified based on the type of softwood being coated. This short leaflet contains the following sections: painting characteristics depend on wood texture and density; selecting wood for painting characteristics; southern exposure is hardest on paint; and when to repaint.
Keywords: Historical document/House paints.

94. **Bruce, David; Schumacher, Francis X. 1935**. Forest mensuration. New York, NY: McGraw-Hill Book Company. 360 p. **Size**: 6½” x 9”. **Notes**: An original copy of the first edition.
Abstract: This book covers the basics of forest mensuration. It is the first edition of a forestry textbook that eventually became a standard in the education of several generations of foresters. This book contains the following chapters: introduction; measurement of diameter; measurement of height; measurement of volume; measurement of age; averages; measures of dispersion and the normal curve of error; the standard error; applications of the normal curve; sampling; the graphic method of rectangular coordinates; effectiveness of free-hand curves in two variables; the board foot and the log rule; estimation by the method of least squares; the transformation of curves into straight lines; estimation by means of two independent variables; least squares with two independent variables; the alinement chart; base alinement charts as first approximations; empirical alinement charts with one curved axis; on the choice of variables; cyclical variation and the growth of timber; growth of the tree; growth of even-aged stands; growth of all-aged stands; 7 appendices; and an index.
Keywords: Forest measurements/Historical document/Timber measurements/Timber volume/Tree measurements/Volume tables.

95. **Brunner, Josef**. **1915**. Douglas-fir pitch moth. Bulletin No. 255. Washington, DC: U.S. Department of Agriculture. 23 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin describes the impacts of Douglas-fir pitch moth, whose larvae cause pitch seams in the wood of the host tree. The distribution, life cycle, and damage caused by this insect are discussed. Pitch moth is associated with Douglas-fir throughout its natural range, both in the Pacific coast region and the Rocky Mountains.
Keywords: Insect damage/Douglas-fir pitch moth/Douglas-fir/Timber defects/Historical document.

96. **Brush, Warren D. 1933**. Selling black walnut timber. Farmers’ Bulletin 1459. Washington, DC: U.S. Department of Agriculture. 20 p. **Size**: 6” x 9”. **Notes**: An original copy. Originally issued in August, 1925 and initially revised in April, 1926. This revision is dated June, 1933.
Abstract: Black walnut is a two to three million dollar timber crop that comes not from extensive forests but from scattered single trees or small groups of trees on farms in 33 states. To make money for its producers it must be cut and marketed intelligently. The farmer must have some knowledge of logging, timber appraising, log scaling, and marketing if he is to realize a profitable return on this valuable by-product of his farm. The purpose of this bulletin is to give him in brief and without technicalities the information he needs.
Keywords: Black walnut/Farm forests/Forestry extension information/Historical document/Hardwood trees.

97. **Bryan, A. Hugh; Hubbard, William F.; Sherwood, Sidney F. 1937**. Production of maple sirup and sugar. Farmers’ Bulletin 1366. Washington, DC: U.S. Department of Agriculture. 35 p. **Size**: 6” x 9”.
Notes: An original copy. Originally issued in February, 1924. This revision is dated June, 1937.
Abstract: The making of maple sugar on a commercial scale is confined to a small part of the territory in which the sugar maple is found, the gradual spring of the North being necessary for a profitable sap flow. This bulletin gives directions for collecting and handling the sap, for making maple sirup and sugar, and for handling and storing the finished products. It also contains directions for caring for maple trees and for planting new maple groves. This bulletin is a revision of and supersedes Farmers’ Bulletin 516.
Keywords: Maple sugar/Maple syrup/Historical document/Farm forests/Forestry extension information.

98. **Buck, C. J. 1930**. Memorandum describing cumulative accomplishment of intensive surveys for District 6. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 2 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short accession consists of a half-page cover memorandum and a 1-page enclosure, which consists of a table entitled “Table showing area covered by intensive timber surveys to January 1, 1930.” The table includes the following information for each of 22 national forests in the North Pacific District of the Forest Service: net area

of national forest (acres); net area in commercial timber zone (acres); net area covered by timber surveys (acres); percent of net area covered by timber surveys; and percent of net commercial timber zone covered. The table shows that the Umatilla NF had 1,252,823 acres of net national forest land; 659,167 net acres in the commercial timber zone; and 76,284 net acres covered by timber surveys, which represented 6.1% of the net forest area and 11.6% of the commercial timber zone acreage.
Keywords: Forest inventory/Historical document/Umatilla NF/Pacific Northwest Region/Timber surveys.

99. **Buckhorn, W. J. 1948**. Defoliator situation in the fir stands of eastern Oregon and Washington. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Insect Laboratory. 21 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Early in the spring of 1947, control of a tussock moth outbreak on the Umatilla National Forest near Troy, Oregon was being considered. Since the outbreak had been discovered but not delineated in the fall of 1946, information was needed about its extent and intensity. The only feasible way to obtain that information in time to consider a control project was to make an aerial survey. A survey was completed on March 24 and 25, 1948 by the author and District Ranger W. W. Ward. Delineation of the infested area was difficult because of problems distinguishing defoliated fir from dormant western larch. The principal infestation area was mapped from the air and then checked from the ground later in the season. A control project was completed on 14,000 acres of heavily-infested, economically-valuable timber. Some 41,000 acres were not treated due to unmerchantability or a light infestation of tussock moth. The treated area was sprayed as a portion of the north Idaho control project with a C-47 airplane carrying 1000 gallons of spray per trip and operating out of Moscow, Idaho, located 65 miles from the project area. The spray was a solution of DDT in fuel oil applied at the rate of one pound of insecticide in one gallon of diluent per acre. The results were "phenomal" with practically 100 percent control resulting. On the unsprayed areas in the Umatilla NF, a polyhedral virus disease appeared near the end of the feeding period and caused widespread mortality of the larvae and pupae. In some instances, as on four small areas to the north and east of Troy, the virus in combination with natural predators virtually wiped out the tussock moth population. Later in the season, the tussock moth infestation developed to a greater extent than anticipated in untreated stands, and in other localities such as one eight miles south of the project area near Promise, Oregon. Other reports came in regarding tussock moth defoliation that ultimately turned out to be western spruce budworm defoliation. In order to help sort out this confusing situation, it was finally decided to make an aerial survey of the 7,755,000 timbered acres of the Blue Mountain region, and to make supplementary ground surveys in the Blue Mountains and elsewhere. This turned out to be the first aerial survey conducted in Region 6 to determine the extent and severity of insect damage. An aerial survey has been conducted every year since then. This report, which describes the results of that first-ever aerial survey, contains the following sections: introduction; Douglas-fir tussock moth (history, situation by forests); spruce budworm (history, situation by forests); summary and discussion; recommendations; tables (summary of survey flights, summary of defoliator situation in fir stands of eastern Oregon and Washington – season of 1947); and maps (Blue Mountains, northern Washington, southern Oregon). Not all of the maps were copied, but the color map showing the Blue Mountains situation (tussock moth – sprayed, tussock moth – unsprayed, spruce budworm) was copied although in 8½" x 11" pieces since the original map was larger than letter size. With respect to western spruce budworm, the most severe defoliation anywhere in the region was on parts of the Umatilla NF near Dale in the Meadow Creek-Desolation Creek drainages. Another large area of budworm infestation on that Forest was a 160,000-acre center near Wall Creek, ranging from Swale Creek on the east to the Spray-Heppner highway on the west. A small infestation center near Battle Mountain State Park was causing considerable public attention. On the northern half of the Umatilla NF, the largest center embraced some 67,000 acres near the headwaters of Phillips Creek, Umatilla River, and Willow Creek.
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/DDT/Douglas-fir tussock moth/Insect control/Meadow Creek/Desolation Creek/Wall Creek/Phillips Creek/Umatilla River/Willow Creek/Swale Creek/Battle Mountain.

100. **Buckhorn, W. J. 1944**. Report of pine beetle survey on the Umatilla National Forest and adjoining private lands; season of 1943. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 5 p. **Notes**: An original copy (2 are available).
Abstract: This report presents data from the ninth annual pine beetle survey. A downward trend that began during 1939 continued unbroken through 1942 and into 1943. In two centers in the Fossil area, infestations that were light in 1941 subsided to normal levels in 1942 and, with that change, normal infestation levels became prevalent all over the Forest. The estimated gross losses for 1942 were 19,160 trees containing 10,360,000 board feet of timber volume.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect damage/Ponderosa pine/Umatilla NF/Western pine beetle.

101. **Buckhorn, W. J. 1944**. Report of the pine beetle survey of 1944 on the Umatilla National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 3 p. **Notes**: An original copy.
Abstract: Three memoranda relating to this report are contained in the front of this copy. This report is labelled thusly at the top: "Forest Insect Investigations; Project h-1-22." The pine beetle survey of 1943 showed that losses from western pine beetle had reached an all time low. However, the 1944 survey showed a sharp increase, and the rate of beetle-caused losses on the Umatilla NF were increasing faster than elsewhere in the pine region of Oregon. Increases were particularly evident near Dixon Guard Station, around Wilson Prairie, in the lower Fivemile Creek drainage, and along Camas Creek south from Ukiah to the forest boundary. Although direct control measures were not proposed, losses near Dixon Guard Station and around Wilson Prairie were serious enough that a salvage logging entry was recommended. The author speculates that the sharp increase in 1944 was tied to a drought that began in late 1943. It was causing abnormally short needles and terminal leaders on the pine trees, and resulted in a very small annual growth ring for 1944. This report also noted that a moderate amount of western spruce budworm feeding was observed on the Heppner Ranger District (perhaps this was one of the first references to a budworm outbreak that would eventually affect most of the Blue Mountains until the late 1950s), and that heavy mortality of white fir and Douglas-fir was noticed at lower elevations, with trees often dying in groups of four or five although one clump with 17 trees was noted. No cause for that mortality was given.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect damage/Ponderosa pine/Umatilla NF/Western pine beetle/Western spruce budworm/Heppner RD/Dixon Guard Station/Fivemile Creek/Camas Creek/Wilson Prairie/North Fork John Day RD.

102. **Buckhorn, Walter J. 1947**. Pine beetle survey of 1946 on the Umatilla National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 7 p. **Notes**: An original copy.
Abstract: An outbreak of the western pine beetle began in Oregon around 1930; the year of greatest intensity was 1932. It would have continued upward from there if an unusually cold winter in 1932-33 had not killed much of the brood as it was attempting to overwinter. Although the outbreak flared up occasionally in the late 1930s, it generally continued downward until reaching a low point in 1943. Beginning in 1944, the outbreak surged upward again in response to a drought. This report documents results of annual surveys that were begun in 1935. A general increase that began in 1944-45 continued upward in 1946, with heavy infestations present near Wilson Prairie, Dixon Guard Station, Kahler Creek, Alder Creek, Deerhorn Creek, Fivemile Creek, and Camas Creek. On the north end of the Forest, an aggressive center existed near the Grand Ronde River west of Troy, Oregon. Extensive losses caused by fir engraver and Douglas-fir beetle were also noted north of Elgin, Oregon. Spruce budworm was still causing problems over a wide area extending as far east as La Grande, and a Douglas-fir tussock moth outbreak was affecting 10 to 12 thousand acres near Troy, Oregon. The report contains one black-and-white photograph showing pole-size Douglas-fir defoliated by tussock moth. In addition to the report itself, this copy includes 4 memoranda pertaining to the report (transmittal of it, response to it, etc.).
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Western pine beetle/ Douglas-fir tussock moth/Fir engraver/Douglas-fir beetle/Kahler Creek/Wilson Prairie/Alder Creek/Deerhorn Creek/Camas Creek/Fivemile Creek/Dixon Guard Station.

103. **Buckhorn, Walter J. 1947**. Second memorandum on the Douglas fir tussock moth outbreak near Troy, Oregon. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report is a detailed supplement to a memorandum dated September 23, 1946, in which a Douglas-fir tussock moth outbreak near Troy, Oregon was briefly described. The outbreak was first found on August 20, 1946, when a pine beetle survey crew was cruising a check plot near Troy. On September 18 and 19 of that fall, the author made a general examination of the general area and estimated that the infestation involved some 10,000 to 12,000 acres. Almost complete mortality of Douglas-fir and white fir had occurred on 500 to 600 acres in patches ranging up to 50 acres. Due to extremely rough terrain and the general lack of roads, the area could not be adequately examined from the ground in the time remaining that fall. Reports from local residents indicated that 1946 was the second year of the outbreak. Heavy deposits of eggs throughout the examined area indicated that the tussock moth population was still increasing and that considerable timber would probably be killed in 1947. The presence of this outbreak was of particular interest because of a concurrent, though much larger, outbreak in Idaho. The proximity of the two outbreaks offered an opportunity to coordinate control efforts if it was decided that direct control measures were warranted for the Troy outbreak. Since the ground examination in September had been incomplete, it was decided to conduct an aerial examination in late March of 1947. Aerial observations of the outbreak

area were made on March 24th and 25th. A major complication associated with the March timeframe was that western larch was still dormant, which made it difficult to discern whether brownish trees were defoliated fir or Douglas-fir, or undamaged western larch. Since western larch often comprised a significant proportion of the mixed-conifer stands in the outbreak area, this complication posed a major problem in deriving an accurate damage estimate. Results of the aerial survey showed heavy defoliation on approximately 1265 acres, moderate defoliation on 23,890 acres, and light defoliation on 30,910 acres. In all, about 56,065 acres supporting 140 million board feet of timber were infested to some extent. Most of the infested acreage occurred on the divide between the Wenaha and Grande Ronde rivers in townships 5 and 6 north, ranges 40, 41, and 42 east. The author believed that the outbreak would eventually subside due to parasites, disease, and other natural factors, but preliminary indications were that it had not yet peaked at the time this report was written and that extensive timber mortality was possible during 1947. Although the author did not yet have enough information to definitively recommend whether aerial control should be initiated, it is clear that he felt that it was feasible and should be considered in conjunction with the Idaho project. The Idaho project was proposing to spray DDT at the rate of one pound in one gallon of oil and at an estimated cost of $1.70 per acre. The author recognized that salvage logging of insect-caused mortality was also an option, although the lack of roads and milling capacity in the area made salvage an unattractive alternative. In 1946, a small lumber mill had just been constructed in Troy and the area opened to logging for the first time. This report includes a colored map showing light, medium, and heavy infestation areas in the area. It is unknown if the map could be digitized; if it could, it certainly should be.
Keywords: Historical document/Insect damage/Umatilla NF/Douglas-fir tussock moth/Chemical insecticides/DDT/Insect control.

104. **Buell, Edward D. 1937**. Forest statistics for Ferry County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 13 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Ferry County's forests in 1935. A small-scale map showing the distribution of forests and nonforest areas is also included. The following topics are discussed: location and description of county; agricultural development and mining; forest land and cover types; productive capacity of forest land; saw-timber volume; forest ownership; and forest use. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Ferry County WA/Forest inventory/Historical document/Colville NF/Colville Indian Reservation.

105. **Buell, Edward D. 1942**. Forest statistics for King County, Washington. Forest Survey Report No. 87. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 18 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of King County's forests in 1932-1933 and 1941. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; description of the county; inventory; forest land; nonforest land; saw-timber volume; ownership of forest resources; forest depletion; forest growth; forest industries; comparison of inventories; and summary. Area and volume tables are included throughout the narrative descriptions.
Keywords: King County WA/Forest inventory/Historical document/Snoqualmie NF.

106. **Buell, Edward D. 1936**. Forest statistics for Klickitat County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 12 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Klickitat County's forests in 1935. A small-scale map showing the distribution of forests and nonforest areas is also included. The following topics are discussed: location and description of county; land classification and use; forest cover types; saw-timber volume; and forest industries. Area and volume tables are included after the narrative descriptions. Bar chart figures summa-

rize important forest statistics.
Keywords: Klickitat County WA/Forest inventory/Historical document/Columbia NF/Yakima Indian Reservation.

107. **Buell, Edward D. 1939**. Forest statistics for Pacific County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 18 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Pacific County's forests in 1932-1933 and 1938. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: location and description of county; forest and land use cover types; productive capacity of forest land; saw-timber volume; ownership of forest resources; forest industries; forest depletion; forest growth; other natural resources; and summary. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Pacific County WA/Forest inventory/Historical document.

108. **Buell, Edward D. 1939**. Forest statistics for Pierce County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 17 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Pierce County's forests in 1932 and 1938. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: location and description of county; forest and land use cover types; productive capacity of forest land; saw-timber volume; ownership of forest resources; forest industries; forest depletion; forest growth; other natural resources; and summary. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Pierce County WA/Forest inventory/Historical document/Snoqualmie NF/Mount Rainier National Park.

109. **Buell, Edward D. 1941**. Forest statistics for Polk County, Oregon. Forest Survey Report No. 83. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 14 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Polk County's forests in 1933 and 1940. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; the forests; productive capacity of forest land; saw-timber volume; forest depletion; forest growth; forest industries; comparison of inventories; and conclusion. Area and volume tables are included throughout this report.
Keywords: Polk County OR/Forest inventory/Historical document/Siuslaw NF.

110. **Buell, Edward D. 1940**. Forest statistics for Thurston County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 15 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Thurston County's forests in 1932-1933 and 1939. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; location and description of county; forest and land-use types and area; site quality of forest land; saw-timber volume;

forest industries; forest depletion; forest growth; land use trends; and summary. Area and volume tables are included after the narratives. Bar chart figures summarize important forest statistics.
Keywords: Thurston County WA/Forest inventory/Historical document/Snoqualmie NF/Nisqually Indian Reservation.

111. **Buell, Edward D. 1937**. Forest statistics for Wallowa County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 14 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Wallowa County's forests that was completed in 1935 and 1936. A small-scale map showing the distribution of the forest and nonforest zones is also included. The following topics are discussed: location and description of the county; nonforest land; forest land and cover types (ponderosa pine and other forest types); productive capacity of forest land; sawtimber volume; forest ownership; economic development of Wallowa County; and forest uses. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Wallowa County OR/Umatilla NF/Wallowa-Whitman NF/Historical document.

112. **Bureau of the Census**. **1952**. 1950 United States census of agriculture; Washington and Oregon; counties and state economic areas. Volume 1, Part 32. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 10 p. **Notes**: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1950 census of agriculture. It includes "County Table 4 (Part 1 of 2).–Livestock and Livestock Products: Censuses of 1950 and 1945" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

113. **Bureau of the Census**. **1967**. 1964 United States census of agriculture. Volume 1, Part 46 and Part 47. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 11 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1964 census of agriculture. It includes "Table 10.–Livestock and Poultry: 1964 and 1959" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

114. **Bureau of the Census**. **1972**. 1969 census of agriculture. Volume 1, Part 46 and Part 47. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 26 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1964 census of agriculture. It includes "Table 7. Livestock and Poultry: 1969 and 1964" for Baker County, Grant County, Morrow County, Umatilla County, Union County, Wallowa County and Wheeler County in Oregon; and Asotin County, Columbia County, Garfield County and Walla Walla County in Washington. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County

WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

115. **Bureau of the Census**. **1977**. 1974 census of agriculture. Volume 1, Part 37 and Part 47. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 11 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1964 census of agriculture. It includes "Table 12. Cattle and Calves – Inventory and Sales: 1974;" "Table 14. Sheep and Lambs – Inventory and Sales: 1974;" and "Table 16. Horses and Ponies – Inventory and Sales: 1974" for Oregon and Washington. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

116. **Bureau of the Census**. **1981**. 1978 census of agriculture. Volume 1, Part 37 and Part 47. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 10 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1964 census of agriculture. It includes "Table 16. Cattle and Calves – Inventory and Sales: 1978;" "Table 20. Sheep and Lambs – Inventory and Sales: 1978;" and "Table 27. Miscellaneous Livestock and Animal Specialties – Inventory and Sales: 1978" for Oregon and Washington. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

117. **Bureau of the Census**. **1932**. Fifteenth census of the United States; agriculture; the western states. Volume I, Part 32. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 14 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from volume II of the fifteenth decennial census (1930) of the United States, summary for agriculture. It includes "County Table IV.–Horses, Mules, Cattle, and Swine on Farms, 1930, 1925, and 1920; Chickens on Farms, 1930; and Chicken Eggs, 1929, 1924, and 1919;" and "County Table IX.–Specified Classes of Livestock on Farms, 1930; and Livestock Products, 1929" for both Washington and Oregon. Those tables summarize the number of horse, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

118. **Bureau of the Census**. **1942**. Sixteenth census of the United States; agriculture; first and second series states reports; statistics for counties. Volume I, Part 6. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 8 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1940 census of agriculture. It includes "County Table IV–Specified Classes of Livestock on Farms and Ranches, April 1, 1940 and 1930, and Jan. 1, 1935; and Specified Livestock Products, 1939 and 1934" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County

WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

119. **Bureau of the Census**. **1961**. U. S. census of agriculture: 1959; counties; Washington and Oregon. Volume 1, Part 46 and Part 47. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 11 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1959 census of agriculture. It includes "County Table 8.–Livestock and Poultry on Farms: Censuses of 1959 and 1954" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

120. **Bureau of the Census**. **1956**. United States census of agriculture: 1954; counties and state economic areas; Washington and Oregon. Volume 1, Part 32. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 9 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1954 census of agriculture. It includes "County Table 7 (Part 1 of 2).–Livestock and Livestock Products: Censuses of 1954 and 1950" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

121. **Bureau of the Census**. **1927**. United States census of agriculture; the western states. Part III. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 7 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from part III of the 1925 Census of Agriculture. It includes "County Table III–Livestock on Farms, January 1, 1925; and Livestock Products, 1924 and 1919" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

122. **Bureau of the Census**. **1946**. United States census of agriculture; Washington and Oregon; statistics for counties. Volume I, Part 32. Washington, DC: U.S. Department of Commerce, Bureau of the Census. 11 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a few pages copied from the 1945 census of agriculture. It includes "County Table III–Livestock and Livestock Products: Censuses of 1945 and 1940" for both Washington and Oregon. Those tables summarize the number of horses, mules, cattle, sheep, and other livestock by county. They were copied to obtain historical information about horses and mules, cattle and calves, and sheep and lambs, since those animals were often grazed on the national forests during the summer months, and it is believed that overgrazing by livestock may have contributed to early deterioration of rangeland condition on public lands.
Keywords: Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/ Cattle and calves/Sheep and lambs/Horses and mules/Census summaries/Asotin County WA/Columbia County WA/Garfield County WA/Livestock damage/Morrow County OR/Wallowa County OR/Wheeler County OR.

123. **Butler, J. W. 1911**. Is lodgepole pine a permanent type on the Madison National Forest? Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 6 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.

Abstract: This report describes the ecology of the lodgepole pine forest type in the northern Rocky Mountains of Montana. Lodgepole pine occurred practically throughout the Madison National Forest, often mixed with Douglas-fir, limber pine, Engelmann spruce, and subalpine fir, but often in pure stands. In the northern portion of the Forest, it occurred frequently in mixture on the mountain slopes; in the southern division, it occurred more often in pure stands either on mountain slopes or on the flat valley bottoms. Its range was from 5,000 to 8,500 feet in elevation. When growing on the flats in areas such as Madison Basin, the soils tended to be sandy and the lack of a taproot commonly resulted in lodgepole pine being windthrown. When growing on mountain slopes further north, where the soils were more compact and covered with a denser undergrowth of grass and other plants, lodgepole pine tended to more windfirm. When young, lodgepole pine could withstand partial shade but it required more light as it grows older. It was much less tolerant of shade than the other trees with which it grew in mixtures. Reproduction was normally very dense where conditions were ideal for its growth; under a heavy cover or where there was any amount of grass or other herbaceous cover, practically no pine regeneration would be found. Reproduction was especially common after fires, since the seedlings could grow with very little water and on dry and not particularly fertile soil. Certain portions of the Madison NF were repeatedly run over by fire until the other competing species were entirely exterminated, leaving the lodgepole pine in complete control. After getting established, lodgepole pine was often able to maintain control of the site. On sites where mature pines were present, there were countless young seedlings growing whenever there were open spaces in the forest. This reproductive advantage was related to lodgepole pine's prodigious cone and seed production – cones were produced on trees as young as 15 to 20 years; older trees often bore from one to five bushels of cones; lodgepole pine was resistant to the late-season frosts that commonly decimated the cone crops of firs and other associated species; cones could be stored on the tree for a long period (serotiny) and still maintain high seed viability; and squirrels seemed to prefer to collect cones from firs and species other than lodgepole pine, thereby giving the pine a competitive advantage. Although lodgepole pine had the advantage following fire and other disturbances, it was possible for firs to come in underneath the pines and to eventually exterminate it due to their greater shade tolerance. The author mentions that dwarf mistletoe infected lodgepole pine on the Madison NF, but that it was not a particularly serious problem since it occurred mostly in the Madison Basin in the region around the Yellowstone Park boundary.
Keywords: Cone serotiny/Forest ecology/Historical document/Lodgepole pine/Dwarf mistletoes/Northern Rocky Mountains/Madison NF.

124. **Camp, Charles L., editor**. **1960**. James Clyman, frontiersman: the adventures of a trapper and covered-wagon emigrant as told in his own reminiscences and diaries. Portland, OR: Champoeg Press. 352 p.
Notes: A photocopy of an original.
Abstract: This book provides diaries and accounts from a fur trapper and emigrant. Only the following sections were copied from this book: book 3, Red Buttes to the Blue Mountains, August 15 to September 30, 1844; book 4, the Blue Mountains to the Valley of the Willamette, October 1 to 13, 1844; and the Oregon Trail (general observations and opinions of the trail and its environs).
Keywords: Eastern Oregon/Historical document/Oregon Trail/James Clyman/Explorer journals.

125. **Cecil, G. H. 1910**. Memorandum regarding Supervisor's inspections. Unpublished Typescript Correspondence. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6 Office. 16 p.
Notes: A digital version of this report is available; filename: Cecil1. Photocopy from an original located at the Pacific NW Region of the National Archives in Seattle, WA.
Abstract: This memorandum is from the District (Regional) Forester to Forest Supervisors in the Pacific Northwest (District 6). It provides instructions for completing inspection reports, which were supposed to be completed by each Forest Supervisor. The format of the inspection reports is similar to that used by the District Office in their earlier inspection efforts (for example, see individual national forest inspection reports prepared mainly by M. L. Erickson). The inspection reports were intended to include the following sections: timber sales; silvics; planting; operation (organization, equipment, etc.); permanent improvements; claims; settlement; uses; grazing; products; and accounts.
Keywords: Historical document/Program administration/Pacific Northwest Region/Oregon/Washington.

126. **Cecil, George H. 1911**. Directions for collecting tree cones. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 12 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document consists of the instructions for collecting tree cones, along with the forms and posters that were needed to implement a cone collection program. The instructions were written in simple, straight-forward terms so that they could be provided to the public (non foresters) directly. The instructions themselves (first 5 pages of this document) include the following sections: why the government wants tree cones; what cones look like;

where to look for cones; when to collect; how to collect; good and bad cones; how to pack cones for shipment; where to deliver cones; and points to remember. The points to remember section is a summary of the other sections and contains items such as "there is good money in it, if you go about it right" and "don't collect wormy cones." Following the instructions document is a copy of form SP-3, which is entitled "Directions to forest officers and others for receipt and shipment of tree cones." It provides ten instructions related to handling and shipping of tree cones, including the proper way to complete a cone tag (which was called form 341). An example of a properly completed government bill of lading is also included in that section of the document. A copy of form SP-2 is also included; it shows how many bushels of cones were received from a collector, the collector's name and address, the date they were received, and the forest officer that received them. This form was designed to be multi-part – the original went to the collector, while the duplicate was retained by the Forest Service. The back of this form stated that payment was based on 2 bushels of cones per sack, and that the Forest Service reserved the right to refuse sacks containing unripe, insect-infested, empty, or otherwise unsuitable cones. Payment would be processed after the cones were received and inspected at the drying kiln. This document also includes an "invoice of cone shipments" form which was completed and sent whenever cones were shipped to a kiln for processing. The last page is a copy of an 8½" x 11" poster entitled "Cones Wanted." It was designed to have blanks filled in describing how much the Forest Service was willing to pay for tree cones, where cone sacks should be delivered, and who to contact for more information.
Keywords: Historical document/Cone collection/Cones/Seed collection.

127. **Cecil, George H. 1917**. Estimated stand of timber by county. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document consists of two memoranda and a telegram. The first memorandum, dated October 17, 1917, was from the Acting Assistant Forester in Washington, DC to the District (Regional) Forester in Portland, OR. It asked the District Forester to provide a rough estimate of the standing timber on the national forests by county, which was needed to make allotment of Section 8 road building funds appropriated by Congress. The need for that information was urgent, as evidenced by a telegram (copy included) from Smith (in Washington) to the District Forester on November 2, 1917. The second memorandum, dated November 1, 1917, was from the District Forester (in Portland) to the Forester (Chief) in Washington. It provides the information requested by the October 17th memo, namely an estimate of commercial timber of all species on national forest lands of District VI, by counties. The figures are provided for Washington counties in one table, for Oregon counties in a second table, and for two California counties in another. A total volume figure is also provided for the entire state of Alaska.
Keywords: Historical document/Timber volume/Alaska/California/Oregon/Washington.

128. **Cecil, George H. 1921**. Instructions for revision of the extensive reconnaissance. Unpublished Typescript Memoranda. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 17 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document consists of four memoranda and a report. The first memorandum, dated October 11, 1921, was from the Assistant Forester (Chief) to the District Forester in Portland, Oregon. It notes that figures relating to the total stand of timber on the national forests of the Pacific Northwest were about 5 years old, and requests that they be revised and submitted to the Forester (Chief) by November 20th. The second memorandum, dated October 28, 1921, was from the District Forester to the Forester (Chief). It states that the District Office has made constant use of the extensive reconnaissance reports completed for each national forest. Enclosed with the memo is an 11-page report entitled "Instructions for revision of the extensive reconnaissance" and dated October 20, 1921. That report notes that it had been almost a decade since the first extensive reconnaissances were completed for Pacific Northwest national forests. However, the cost of those reports and maps had been repaid many times over in terms of their subsequent usefulness. Some of the data in the extensive reconnaissances had become outdated due to changes in national forest boundaries, exchanges, eliminations and additions, and inaccuracies in the base maps. It was proposed that an office revision of the reconnaissances be completed during the winter of 1921-1922, and that maps and tabulations be brought up to date at that time. The instructions provide detailed instructions for the maps (status, blocks, compartments, cover types), including a 3-page colored legend showing the symbols and colors to be used with non-forest, woodland, and forest cover types. The third memorandum, dated November 2, 1921, was from the Assistant Forester to the District Forester. It acknowledges receipt of the letter and enclosure of October 28th, and reiterates that the Forester expected a reply to his October 11th request for new estimates of the total timber stand on each Forest. The fourth memorandum, dated November 8, 1921, was from the District Forester to the Forester. It states that revised estimates of the total timber stand were enclosed, as requested in the Forester's letter of October 11th. The revised estimates (an enclosure to the letter) were copied on two over-sized sheets and folded down to an 8½" by 11" size. The total timber stand for national forests in the Blue Mountains was shown to be:

Malheur NF, 6,560,000 MBF; Umatilla NF, 3,533,000 MBF; Wallowa NF, 3,611,000; and Whitman NF, 6,373,000 MBF.
Keywords: Historical document/Timber volume/Malheur NF/Umatilla NF/Wallowa NF/Whitman NF.

129. **Cecil, George H. 1913**. Wagon roads within the national forests of Washington. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 1 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is a short memorandum from the District (Regional) Forester to the Forester (Chief) dated January 3, 1913. It had a file designation of District – Improvement. The body of the letter is "in answer to our telegraphic request the Supervisors in the State of Washington have submitted figures showing that there are approximately 896 miles of wagon roads within the National Forests of that State, exclusive of that constructed wholly or in part by the Service, and you were wired to that effect. The distribution of these wagon roads within the Forests is as follows: (table follows)." The table shows that there were 62 miles of wagon road located within the Wenaha NF in the state of Washington.
Keywords: Access management/Historical document/Washington/Wenaha NF/Wagon roads.

130. **Chadwick, S. F. [Date unknown]**. Enumeration of the inhabitants and industrial products of the state of Oregon, for the year 1875. Unnumbered Report. [Place of publication unknown]: [Publisher unknown]. 2 p.
Notes: A photocopy of an original located at the Oregon State University Library in Corvallis, Oregon.
Abstract: This item consists of a single, wide-format table copied on 2 8½" x 11" sheets. It summarizes the inhabitants of Oregon (males and females by age categories) and the industrial products of Oregon, by county. The products summarized are: acres of land in cultivation; bushels of wheat raised; bushels of oats raised; bushels of barley raised; bushels of rye raised; tons of hay; pounds of wool; ounces of gold dust; bushels of corn; number of sheep; number of hogs; number of horses; number of cattle; pounds of tobacco; bushels of potatoes; bushels of apples; feet of lumber; barrels of salmon; bushels of flax; cases of salmon; baskets of oysters; number of mules; pounds of cheese; and pounds of butter. As of 1875, Oregon had 104,920 inhabitants, not counting Indians and Chinese who were excluded from the Census, estimated at an additional 16,000. The only counties that existed for northeastern Oregon were Baker, Grant, Umatilla, Union, and Wasco.
Keywords: Agriculture/Baker County OR/Grant County OR/Historical document/Umatilla County OR/Union County OR/Wasco County OR/Cattle and calves/Sheep and lambs/Horses and mules/Census summaries.

131. **Chaffee, R. R. 1910**. Annual silvical report: Deschutes National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 36 p.
Notes: A digital version of this report is available; filename: Deschutes1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This early silvical report pertains to the Deschutes NF, which included two units or divisions at that time: the Blue Mountains unit (western part of current Ochoco NF?), and the Paulina Mountains unit. The report includes the following sections: list of trees; list of shrubs; fundamental forest types; general silvical description of each type; silvics of each species; silvical problems; and remarks. A wide variety of silvical characteristics are described for each species (habit, occurrence, soil and moisture, shade tolerance, growth and longevity, reproduction, susceptibility to injury, etc.).
Keywords: Historical document/Deschutes NF/Ochoco NF/Silvics/Western white pine/Whitebark pine/Ponderosa pine/Lodgepole pine/Western larch/Engelmann spruce/Douglas-fir/Subalpine fir/Grand fir/White fir/Western juniper/Willows/Water birch/Quaking aspen/Black cottonwood/Thinleaf alder.

132. **Chapman, C. S. 1911**. What Oregon is doing to prevent forest fires. American Forestry. 27 (10 (Oct.)): 584-586.
Notes: A photocopy of an original.
Abstract: This short article describes forest fire prevention activities in Oregon, the "greatest timber state in the union." At the time of this article, Oregon's reputation seemed to be one of a state that wasn't overly concerned about forest fires. The article describes the resources that are being allocated to fire fighting and fire prevention by the State, private landowners, and fire cooperatives and protection associations. A discussion about danger places (slashings and old burns) and state aid available for fire prevention is also included.
Keywords: Fire control/Fire fighting/Fire prevention/Forest fires/Historical document.

133. **Chapman, Herman H. 1931**. Forest management. Albany, NY: J. B. Lyon Company. 544 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: This classic work includes the following chapters: trees and forests; park and recreational uses of forests; protection forests; economic forestry versus lumbering; the margin for economic forestry; the field of forest pro-

duction; underlying principles of forest management; forestry as a business investment; principles of forest organization; evolution of forest organization; organization of a large forest enterprise; acquisition and consolidation of forests; boundaries; the coordination of land uses; projects for the collection of facts; subdivisions of the forest area; plans for development of forests; the economic basis of regulation; silvicultural methods; formation of the working circle and of working groups; the rotation; timber sales; the cutting cycle; the normal forest; the problem of regulation of yield; volume regulation; regulation by area and volume; the horizontal cut as a method of forest regulation; the regulation of wild forests; the stand method and summary of forest regulation; management plans; and the control of forest operations under the management plan.
Keywords: Historical document/Forest management/Forest policy/Forest regulation/Forest organization.

134. **Chapman, Herman H. 1950**. Forest management. Bristol, Conn.: The Hildreth Press. 582 p. **Size**: 6" x 9".
Notes: An original copy. A revision of the 1931 edition (see Chapman 1931) .
Abstract: Forest management is primarily concerned with the organization of specific, individual forest properties for the continuous production of timber crops to supply economic needs. It is distinguished from forest management whose primary purpose is for recreation, or for protection of watersheds, in that the business principles which characterize economic management are in such cases subordinated to the more important objectives of direct public benefit from forest cover or scenery. Timber production for economic use then becomes secondary. Except for this change in objectives and emphasis, many of the business principles of forest management apply to recreation forests, with special emphasis on forest protection.
Keywords: Historical document/Forest management/Forest policy/Forest regulation/Forest organization.

135. **Chase, Agnes**. **1922**. First book of grasses. New York: The Macmillan Company. 121 p. **Size**: 5" x 7.5".
Notes: An original copy.
Abstract: The subtitle of this book is: "the structure of grasses explained for beginners." Of all plants, grasses are the most important to man. The different species are known by very few, even among botanists. This is largely because they are supposed to be very difficult. When the structure of grasses is clearly understood, they are no more difficult to study than other plants. The methods included in this book were used by the author for some years in teaching students. The introduction explains the method used in the book. The main body of the book consists of 12 lessons, arranged from the simplest to the most complex. Each lesson is accompanied by figures that bring out the facts explained in the text. Grasses indigenous to the United States are used for the lessons and the commoner ones are selected whenever possible. Following lesson 12, the book includes two other chapters: diagrammatic summary of the primary characters of the tribes; and general information for the beginner. This book includes numerous line drawings that illustrate various morphological characteristics of grasses.
Keywords: Botany/Grasses/Historical document/Plant identification.

136. **Chidsey, Thomas E. 1910**. Annual grazing report, Umatilla National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Umatilla National Forest]. 10 p.
Notes: An original copy. A digital version of this report is available; filename: Umatilla10.
Abstract: This double-spaced typescript report describes livestock grazing conditions on the Umatilla National Forest as of 1910. The report begins by stating "the grazing conditions on the Umatilla Forest for the past three years have been very bad owing to the light rainfall and almost total absence of snow in the mountains. The average annual precipitation is from ten to fifteen inches, but during the last three seasons it has fallen below the average, the last season rain and snowfall being only about five inches." After describing general conditions for both cattle and sheep, not just in terms of forage and water availability but also with regard to market conditions, the report also contains these sections: range divisions, protection, permit allotments, and recommendations. The recommended number of cattle and horses, and sheep, is enumerated for each of the Forest's allotments. Chidsey ends the report by recommending a reduction in permitted numbers, which had been 75,000 sheep and 11,500 cattle during the previous year, but the reduction was based mostly on the elimination of almost 70,000 acres from the national forest, although he admitted that a further reduction would be necessary if the drought continued or destruction of the forage resource would ensue.
Keywords: Cattle grazing/Blue Mountains/Grazing damage/Grazing/Historical document/Range management/ Sheep grazing/Umatilla NF.

137. **Clapp, Earle H. 1911**. Fire protection in the National Forests. American Forestry. 17 (10 (Oct.)): 573-584.
Notes: A photocopy of an original.
Abstract: Discusses the following topics with regard to fire control and protection on the national forests: fire plans; value of material and risk; causes and prevention; education; cooperation; and permanent improvements. This article was prepared in two parts; the second part was published in the November 1911 issue and is attached to

the October portion in the archive. The November article discussed the following topics: equipment; organization; patrol; and fighting fires.
Keywords: Fire control/Fire fighting/Fire prevention/Forest fires/Historical document.

138. **Clapp, Earle H. 1914**. Instructions for intensive timber reconnaissance. Unpublished Typescript Report. [Washington, DC]: U.S. Department of Agriculture, Forest Service. 19 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: These instructions were issued by the Forester (Chief of the Forest Service) on April 3, 1914 for use by all individuals or parties doing intensive timber reconnaissance, timber sale examinations, or forest-type mapping. The main objective was to standardize reconnaissance methods to whatever extent was necessary to ensure reasonably accurate and uniform results. Many details were meant to be left to each District (Region), but certain broad principles were applicable to all of the Districts. This report includes the following sections: object and scope of reconnaissance; correlation between reconnaissance and stumpage appraisal; preliminary field examination; plan of work; organization; field methods (surveys, mapping, estimating, yield and increment, and notes); checks and inspection; equipment; compilation in the field and at the end of each season (maps, estimates, and notes); preparation of forest plans; cost keeping; progress reports; and original field data. Three primary criteria were used to select areas for an intensive timber reconnaissance: areas for which bona fide timber sale applications had been received; areas within which desirable sales could undoubtedly be made if volume estimates were available; and divisions in which there was danger of overcutting, either in large or small sales. [Note that District (Regional) foresters issued their own instructions for intensive timber reconnaissance based on this national direction. For example, the District Forester for District 6 issued "Instructions for intensive timber reconnaissance east of the Cascade Mountains" on May 12, 1914 (copy included in the history archives), approximately 6 weeks after receiving the Forester's instructions.]
Keywords: Forest inventory/Forest mapping/Historical document/Land classification/Timber reconnaissance.

139. **Clapp, Earle H. 1912**. Silvicultural systems for western yellow pine. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 17 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Western yellow pine was one of the most important trees on the national forests, especially considering the immense area in the western United States where it occurred and the fact that it had been harvested more extensively up to that time than any other tree species. This paper summarizes the characteristics and management of western yellow pine as it was known in 1912, and it was based on information that had been collected throughout the range of the species in the West. The silvicultural objective was to initiate management with a light cut to remove the mature and decadent material that would not survive until a second entry. That strategy would make it possible to rapidly cover the yellow pine type in an extensive fashion, and also start some reproduction. In general, the first entry did not remove more than two-thirds of the merchantable volume and often even less. Clapp then describes the maturity selection system, where approximately two-thirds of the volume was removed and stands managed using a tentative rotation of 180-200 years and a cutting cycle of 40-60 years. He mentions that this modified form of group selection had been used in California, advocated in the Southwest, and clearly recognized in the Northwest. There were three conditions or classes discussed by Clapp with regard to natural reproduction: 1) a comparatively large proportion of the yellow pine region had moisture and other conditions favorable enough for abundant natural regeneration; 2) a smaller portion of the yellow pine type where moisture and other conditions were such that natural reproduction could be obtained, but only with very careful cutting and over a long regeneration period; and 3) an area of considerable extent where natural regeneration can not be expected to follow any type of cutting due to extremely adverse environmental conditions. In situations where western yellow pine occurred in mixed stands, it was recommended that the inferior species be cut out of the stand whenever possible.
Keywords: Ponderosa pine/Timber yields/Silvics/Historical document.

140. **Clark, F. A. 1904**. The proposed Chesnimnus Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. 3 p.
Notes: A digital version of this report is available; filename: Chesnim1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report provides some information about the proposed Chesnimnus Forest Reserve, an area of about 185,140 acres located in the extreme northeastern portion of Oregon. Limited information about forest conditions, alienated lands, and grazing is provided, as are recommendations supporting establishment of a Reserve.
Keywords: Historical document/Chesnimnus Forest Reserve/Wallowa-Whitman NF/Blue Mountains.

141. **Clarke, Frank A.; Langille, H. D. 1904**. The proposed Wallowa Forest Reserve, Oregon. Unpublished Typescript

Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. 4 p.
Notes: A digital version of this report is available; filename: Wallowa1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report provides limited information on the following topics: location and area; topography; forest; estimated stand of timber; land classification; industries; sentiment; and recommendations.
Keywords: Historical document/Wallowa Forest Reserve/Blue Mountains/Wallowa-Whitman NF/Forest management.

142. **Cleator, F. W. 1930**. Special use cabin at Stayawhile Spring. Photo Number 248017. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Stayawhile Spring. **Size**: 4½" x 6½".
Notes: An original copy, attached to an 8" x 10½" sheet of paper.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is attached to a Form R6-E13 that was used for camera point work during this time period. Information from the form includes: AS (E&I), Camera Points file designation; I-STUDIES, Special Use Residence subject; CPS# 19; date July 1930; location Stayawhile Spring; photo no. 1; light good; picture taken by F. W. Cleator; and a description of scene as "Photograph #248017 taken in July 1930 by F. W. Cleator. Special use cabin at Stayawhile Spring." .
Keywords: Umatilla NF/Historical photograph/Stayawhile Spring.

143. **Cleator, F. W. 1930**. Target Meadow. Photo Number 247979. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Target Meadow. **Size**: 4" x 6½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is attached to an 8" x 9" camera point study report form (Form R6-E13). The form provides the following items: CPS #: 26; date: July, 1930; location: Target Meadow; photo no. 1; light: good; picture taken by: F. W. Cleator; description of scene, bringing out salient points of study which will make it of value for future reference – attach additional sheet if necessary: "photograph #247979 taken in July 1930 by F. W. Cleator. Target Meadow from south end, 2/3 mile in length.".
Keywords: Umatilla NF/Historical photograph/Mountain meadows/Walla Walla RD/Target Meadow.

144. **Cleator, F. W. 1930**. Twin Buttes. Photo Number 248018. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Twin Buttes Park recreation area. **Size**: 4½" x 6½".
Notes: An original copy, attached to an 7" x 9½" brown card stock.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. The caption at top of card states "Twin Buttes Park recreation area from road 1 mile southeast. Breaks right to Butte Cr." The image was acquired by F. W. Cleator on 7/29/30.
Keywords: Umatilla NF/Historical photograph/Twin Buttes/Wenaha-Tucannon Wilderness.

145. **Clements, Edith S. 1926**. Flowers of mountain and plain. New York, NY: The H. W. Wilson Company. 79 p.
Size: 6" x 9". **Notes**: An original copy of the third edition.
Abstract: This book was originally published in 1915. It was intended for travelers and flower lovers who wished for an easy way to identify flowers seen on excursions or from car windows. It could also serve as a souvenir of pleasant summer days or vacation trips in the Rockies. The book consists of twenty-five beautiful color plates with watercolor renderings of one hundred and seventy-five of the most striking wildflowers of the mountains and plains of the West. In the original edition, the book consisted of just the plates; by the second edition, short, half-page narratives were added for each plant species. Once again, the narratives were designed for an audience of lay persons; they avoid specialized or technical terms and emphasize the cultural aspects of the plants or provide interesting comments about their life cycle or customary habitat. The beautiful plates were taken from a larger work called "Rocky Mountain Flowers" by Clements and Clements (1914; most current printing 1963); a copy of that work is also contained in the history archives.
Keywords: Botany/Historical document/Plant identification/Wildflowers/Rocky Mountains.

146. **Clements, F. E. 1910**. The life history of lodgepole burn forests. Bulletin No. 79. Washington, DC: U.S. Department of Agriculture, Forest Service. 56 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Describes the post-fire development of lodgepole pine forests, as based on studies in the vicinity of Estes Park, Colorado. The following topics are discussed: the forests of Estes Park; burns in Estes Park; methods of fire history reconstruction; the burns of 1905, 1903, 1901, 1896, 1891, 1878, 1864, 1842, 1781, 1753, 1722, and 1707; cone and seed production of lodgepole pine; the opening of lodgepole cones; distribution and germination of seeds;

relation of development and growth to light and water; relationship of regeneration to competition; and the future development and management of lodgepole pine forests.
Keywords: Lodgepole pine/Colorado/Fire effects/Fire history/Cone serotiny/Natural regeneration/Silvics/Historical document.

147. **Clements, Frederic E. 1936**. Nature and structure of the climax. Journal of Ecology. 24: 252-284.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article includes the following sections: introduction; the climax concept; nature of the climax; climax and proclimax; structure of the climax; rank and correspondence of units; table of climax and seral units; and references. This paper is important because Clements was an early proponent of the climax stage of vegetation development as an ecological concept. His writings and philosophies were occasionally controversial in the ecological community during the early part of the twentieth century, when they had a great influence on future concepts regarding vegetation classification.
Keywords: Historical document/Plant succession/Vegetation classification/Frederic Clements.

148. **Clements, Frederic E.; Clements, Edith S. 1963**. Rocky Mountain flowers: an illustrated guide for plant-lovers and plant-users. New York, NY: Hafner Publishing Company. 390 p. **Size**: 6" x 9".
Notes: An original copy of the third reprinting of the third edition.
Abstract: This book was originally published in 1915. It describes the flora of the Rocky Mountain region, which was delineated as Colorado, Wyoming, most of Montana, northern New Mexico, eastern Utah, and the western portions of North and South Dakota, Nebraska, and Kansas. The book contains twenty-five beautiful color plates with watercolor renderings of one hundred and seventy-five of the most striking wildflowers of the mountains and plains of the West. Another 355 species are illustrated with black-and-white line drawings. The beautiful plates were also used in a smaller work called "Flowers of Mountain and Plain" by Edith S. Clements (1926; originally published in 1915); a copy of that work is also contained in the history archives. This book also includes an interesting, one-page color key to major plant groups or families that was originally published in National Geographic magazine. It also contains comprehensive keys to the families, genera, and species. Each genus is described using a short narrative, although individual species are generally not.
Keywords: Botany/Historical document/Plant identification/Wildflowers/Rocky Mountains.

149. **Clouston, John G. 1942**. Memorandum regarding big-game management in the Blue Mountains. Unpublished Typescript Memorandum. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 5 p. **Notes**: A photocopy of an original.
Abstract: This accession is a memorandum to the files dated November 17, 1942. It concerns the proper management of big game in the Blue Mountains of eastern Oregon, particularly with regard to the following issues: number of game animals; distribution of game animals; condition of summer and winter forage for game; and the capability of particular areas to produce this forage or carrying capacity of the range. Winter range, consisting mostly of browse or shrubs, was more critical than summer forage because of its restricted usable area. Most of this memorandum consists of extensive quotes from surveys that were made during the summer and fall of 1942. Almost three pages of quoted material is from Mr. Mitchell, who was in charge of Wildlife Management in the Regional Office in Portland, and was based on a winter-range survey of the Ukiah District of the Umatilla NF and the north portion of the Whitman NF. That material provides interesting insights about elk browsing preferences, the beaver situation at that time, and the condition of specific plant species being used for browse or forage by big-game species. Minor quotes were also provided from a Mr. Douglas, who was Assistant Regional Forester in charge of the Division of Wildlife and Range Management. Douglas' quotes concern a trip made during the fall of 1942 by him, Mr. Mitchell, and a Dr. Shantz from the Washington Office of the Forest Service. Clouston also provides a short table summarizing the number of deer and elk estimated to be using the Ukiah District of the Umatilla NF for the years 1937-1941. The elk population for the entire Umatilla NF was estimated to be 8,500 head in 1941, whereas the estimated carrying capacity of the Forest was thought to be 6,400 head, indicating that big-game ranges were already overstocked by 1941. Clouston then goes on to recommend annual kill rates for 1942 to 1944 that were designed to bring elk populations down to the carrying capacity level. The author also recognized that livestock grazing was contributing to a lack of forage for big game animals, and provided a short table summarizing permitted animal-units for the Forest between 1937 (32,077 units) and 1941 (22,270 units). He also mentioned that the all-time high livestock rate for the Forest was 85,444 animal units in 1907, with a war-time high of 57,156 units in 1918.
Keywords: Historical document/Range management/Umatilla NF/Big game/Wildlife management/Beaver/Elk.

150. **Coman, Warren E. 1911**. Did the Indian protect the forest? Pacific Monthly. 26 (3 (Sept)): 300-306.
Notes: A photocopy of an original.

Abstract: The author examines the premise that American Indians have been accustomed to burning native forests for centuries. He claims that some preservationists of that day ascribed forest preservation as the Indians' motive for their prescribed burning, but strongly disagrees with that contention. He states that Indian burning was geared solely toward their immediate needs for food plants, animal forage, etc., and that any beneficial effects from Indian burning on forest preservation or perpetuation were accidental rather than designed. The author examines two systems of forest protection from destructive wildfire: annual burning, or forest patrols. He advocates a concerted, systematic system of patrols as the best way to prevent disastrous conflagrations.
Keywords: Historical document/Fire control/Fire ecology/Fire prevention/Forest fires.

151. **Connaughton, Charles A. 1936**. Fire damage in the ponderosa pine type in Idaho. Journal of Forestry. 34: 46-51. **Notes**: A photocopy of an original.
Abstract: This article reports on a study in a 45,000-acre wildfire area in the Payette National Forest of northern Idaho. The fire burned in late August of 1931, in practically a pure ponderosa pine forest type with a variety of age and condition classes. The burned area was classified as three strata for the purposes of assessing fire effects: virgin stands, recent cut-over stands, and young-growth stands established on old clearcuts. It was found that 43% of the virgin area, 23% of the cut-over area, and 21% of the young-growth area had been burned by a severe crown fire. Most of the remaining area had been burned over by surface fires of varying intensity. Unburned patches within the fire perimeter were relatively unimportant, occupying less than 1% of the virgin area and 4% of the cut-over and young-growth areas. A post-fire survey, conducted approximately one year after the burn, indicated that 29.3%, 28.9%, and 48.3% of the merchantable volume in the virgin, cut-over, and young-growth stands, respectively, survived the fire in what was considered a living condition. Total volume losses for ponderosa pine and Douglas-fir combined, including delayed mortality occurring years after the fire, was 73%, 74%, and 54%, respectively, in the virgin, cut-over and young-growth stand types.
Keywords: Fire effects/Historical document/Payette NF/Ponderosa pine/Northern Idaho.

152. **Conover, C. J. 1921**. Descriptive and cost reports; Powwatka Ridge timber survey project, Wallowa National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 14 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The Nibley Mimnaugh Lumber Company made application for the purchase of Government timber located near the northwestern edge of the Wallowa National Forest. This report documents the results of a timber survey project initiated in response to their application. The lumber company's logging railroad had been extended to within a few hundred yards of the southern edge of the survey area and was a good route for the logs to travel if the Powwatka Ridge was to be logged by railroad. The survey was conducted with a five-man crew starting on August 10th and concluding on September 24, 1920, although the college students left on September 9th to return to school. The survey area included 12,766 acres, which excludes private lands in the area. Of the total timber stand in the area, 54% was yellow pine, 26% was Douglas-fir, 12% western larch, and 8% white fir, with small amounts of lodgepole pine and Engelmann spruce. The yellow pine occurred in pure stands on dry areas with shallow soils, but the highest merchantable volume of yellow pine was along Washboard Ridge and in other transition areas with mixed stands. Stands comprised of inferior species covered nearly one third of the survey area, generally upon northern exposures and in the draws. They consisted of western larch and Douglas-fir in the overstory, and grand fir in the understory. The author strongly recommended that inferior species be discouraged or removed whenever possible, since excellent yellow pine timber will grow upon the sites that were occupied by them. Alder, dwarf maple, cottonwood, and hawthorne grow in the creek bottoms. Timber volumes per acre on the area were generally low, averaging about 8,000 feet per acre in the portions with mature timber. The timber was not deteriorating rapidly and could safely be held until a more favorable lumber market existed. Some insect damage was noted in the area, possibly fostered by the ranchers' habit of girdling trees several years before they intended to cut them for firewood. The area was considered very flammable, as a fire was discovered and extinguished during the survey and several large fires were burning on private land to the south of the Forest. Snags were not particularly common; about three per acre or 120 per forty acres were encountered. Many of the snags were western larches below 20 inches in diameter that had been killed by dwarf mistletoe. The report includes the following sections: a project map (in color, showing the boundaries of the examined area, patented (private) lands, and homestead entries); introduction; status and ownership; silvical description; logging data; management; tables, and accuracy of work. The report includes 3 tables summarizing the survey results by township and range. Appended to this descriptive report is a separate 3-page Cost Report. The cost report includes the following sections: field work; office work; and total cost.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Wallowa-Whitman NF/Wallowa NF/Powwatka Ridge.

153. **Cook, S. F. 1955**. The epidemic of 1830–1833 in California and Oregon. University of California Publications in American Archaeology and Ethnology. 43 (3): 303-326. **Notes**: A photocopy of an original.
Abstract: In the summer of 1830, a new disease appeared on the banks of the lower Columbia River which rapidly incapacitated most of the white settlers and decimated the native population. In the course of 1833, what seems to have been the same disease overtook both white man and red man alike in the great central valley of California. Although there has been much uncertainty about the origin of the epidemic, there is little doubt about its significance for it was largely responsible for the destruction of the Sacramento River and Columbia River indian tribes, thereby facilitating the settlement of those valleys by the Americans. The balance of this article discusses the nature of the malady, the origin and course of the epidemic, and damage to the native populations.
Keywords: Historical document/Oregon history/California/American Indians/Human disease.

154. **Cooper, Albert W. 1906**. Sugar pine and western yellow pine in California. Bulletin No. 69. Washington, DC: U.S. Department of Agriculture, Forest Service. 42 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the management of sugar pine/yellow pine forests in California, including the following topics: range and distribution, associated species, forest types, stand and volume tables, description of the species (sugar pine, yellow pine), growth, wood characteristics, commercial importance of the type, fire effects, lumbering practices, and management recommendations for both private and federal lands.
Keywords: Sugar pine/Ponderosa pine/California/Silvics/Fire effects/Forest management/Wood characteristics/ Timber harvesting/Historical document.

155. **Cooper, William S. 1926**. The fundamentals of vegetational change. Ecology. 7 (4): 391-413.
Notes: A photocopy of an original.
Abstract: This paper examines the "foundation" and "superstructure" of a field of science referred to as "dynamic ecology." The foundation was defined as the fundamental facts upon which the science (dynamic ecology in this instance) is built, whereas the superstructure includes the more or less arbitrary and subjective concepts that are superimposed on the facts. Some examples of foundation facts are the universality of change; the nature, direction and rate of change; and the causes of change. Examples of superstructure concepts include community, succession, development, progression, retrogression, climax, and so forth. This paper develops those concepts further in the following sections: introduction; historical survey; the foundation (universality of change, types of vegetational change, stream of vegetational change, and the directive causes); the superstructure; and conclusion. In this paper, the author hoped to encourage a more fluid thought process, since he felt that many of the prevalent concepts in ecology were entrenched and rigid. He recommended that concepts and terms which clearly tended toward rigidity be abandoned, and that any terms which were retained should keep a spirit of flexibility in order that they be a faithful representation of the truth. Much of this paper deals with the ecological concepts of succession, climax, plant communities, and related topics, especially as they were promulgated and developed by Frederic Clements.
Keywords: Historical document/Plant ecology/Frederic Clements/Forest ecology/Plant succession/Vegetation classification/Climax vegetation/Plant communities.

156. **Cottam, Grant; Curtis, J. T. 1949**. A method for making rapid surveys of woodlands by means of pairs of randomly selected trees. Ecology. 30 (1): 101-104. **Notes**: A photocopy of an original.
Abstract: The random pairs method of ecological sampling was developed as a means of evaluating the data contained in the records of the original land survey (Government Land Office surveys) for an area in southwestern Wisconsin. If trees grew at a "perfect" spacing, they would be equidistant from each other and each tree could be thought of as occupying the center of a hexagon. Since the trees in a real forest are not equally spaced, the random pairs method attempts to derive an average distance between pairs of randomly selected trees in a sampled area. The random pairs method involves the use of an angle of exclusion to select two individuals (plants, trees, etc.) as a sample unit. The individual closest to a sample point (a stake or other point in or on the ground) is located first, and an angle then delimited with its vertex at the sample point and its bisector on the closest individual. Any other individual plant falling within this angle is excluded, and the distance is measured between the individual closest to the sample point and the individual nearest to it that is also outside of the angle of exclusion. This method then generates a "random pair" for sampling purposes – one half of the pair being the individual closest to the sample point, and the second half being the individual closest to the first one, but located outside of an angle of exclusion formed using the sample point and the first individual. Obviously, a complicated sampling scheme! This paper describes a comparison between typical quadrat sampling and the random pairs method as they were applied in oak-hickory and maple-basswood forests in the southern Lake States (Dane County Wisconsin). The quadrat method yielded more accurate results than the random pairs method, but at a considerable increase in time. The authors note that 56 hardwood stands in southern Wisconsin had been sampled using the random pairs method, with very satisfactory

results.
Keywords: Ecology/Forest inventory/GLO survey notes/Sampling/Random pairs sampling.

157. **Cottam, Grant; Curtis, J. T.; Hale, B. Wilde**. **1953**. Some sampling characteristics of a population of randomly dispersed individuals. Ecology. 34 (4): 741-757. **Notes**: A photocopy of an original.
Abstract: The random pairs method of ecological sampling was developed as a means of evaluating the data contained in the records of the original land survey (Government Land Office surveys) for an area in southwestern Wisconsin. If trees grew at a "perfect" spacing, they would be equidistant from each other and each tree could be thought of as occupying the center of a hexagon. Since the trees in a real forest are not equally spaced, the random pairs method attempts to derive an average distance between pairs of randomly selected trees in a sampled area. The random pairs method involves the use of an angle of exclusion to select two individuals (plants, trees, etc.) as a sample unit. The individual closest to a sample point (a stake or other point in or on the ground) is located first, and an angle then delimited with its vertex at the sample point and its bisector on the closest individual. Any other individual plant falling within this angle is excluded, and the distance is measured between the individual closest to the sample point and the individual nearest to it that is also outside of the angle of exclusion. This method then generates a "random pair" for sampling purposes – one half of the pair being the individual closest to the sample point, and the second half being the individual closest to the first one, but located outside of an angle of exclusion formed using the sample point and the first individual. Obviously, a complicated sampling scheme! This paper describes an experiment in which a map was developed that included 1,000 individuals located by means of rectangular coordinates taken from a random numbers table. Variability or relative density measurements was then assessed using a variety of sample sizes. Variability was very high with small samples; once the sample included 30 or more individuals, reasonable accuracy was obtained. The experiment showed that variability is inherent in randomly distributed populations and that careful planning was important for selecting a sample method that would account for inherent variability. The authors recommended that larger samples be used than were commonly employed at that time.
Keywords: Ecology/Forest inventory/GLO survey notes/Sampling/Random pairs sampling.

158. **Cottam, Grant; Curtis, John T. 1955**. Correction for various exclusion angles in the random pairs method. Ecology. 36: 767. **Notes**: A photocopy of an original.
Abstract: The random pairs method of ecological sampling was developed as a means of evaluating the data contained in the records of the original land survey (Government Land Office surveys) for an area in southwestern Wisconsin. If trees grew at a "perfect" spacing, they would be equidistant from each other and each tree could be thought of as occupying the center of a hexagon. Since the trees in a real forest are not equally spaced, the random pairs method attempts to derive an average distance between pairs of randomly selected trees in a sampled area. The random pairs method involves the use of an angle of exclusion to select two individuals (plants, trees, etc.) as a sample unit. The individual closest to a sample point (a stake or other point in or on the ground) is located first, and an angle then delimited with its vertex at the sample point and its bisector on the closest individual. Any other individual plant falling within this angle is excluded, and the distance is measured between the individual closest to the sample point and the individual nearest to it that is also outside of the angle of exclusion. This method then generates a "random pair" for sampling purposes – one half of the pair being the individual closest to the sample point, and the second half being the individual closest to the first one, but located outside of an angle of exclusion formed using the sample point and the first individual. Obviously, a complicated sampling scheme! This paper describes some mathematical corrections that needed to be made to the original description of the random pairs method (the original description was a journal article by Cottam and Curtis in 1949).
Keywords: Ecology/Forest inventory/GLO survey notes/Sampling/Random pairs sampling.

159. **Cottam, W. P.; Stewart, George**. **1940**. Plant succession as a result of grazing and of meadow desiccation by erosion since settlement in 1862. Journal of Forestry. 38 (8): 613-626. **Notes**: A photocopy of an original.
Abstract: Describes the history of a mountain meadow in southwestern Utah since settlement of the area in 1862. The following topics are discussed: description of mountain meadows; history of the area; severe grazing, drought, and floods; observed data; the wash and the soil; a relict meadow and the old one; present status of grass succession; sagebrush- rabbitbrush association; russian thistle society; foothill sagebrush association; juniper association; competition between junipers and sagebrush; plant succession; and a summary.
Keywords: Grazing/Grazing damage/Great Basin/Historical document/Junipers/Mountain meadows/Plant succession/Range history/Range management/Utah.

160. **Coville, Frederick V. 1898**. Forest growth and sheep grazing in the Cascade Mountains of Oregon. Bulletin No. 15. Washington, DC: U.S. Department of Agriculture, Division of Forestry. 54 p. **Size**: 6" x 9".

Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: While completing a botanical exploration of the Pacific Coast region in 1897, the author studied the effects of sheep grazing on forest growth in the Cascade Range Forest Reserve of central and southern Oregon. The study concluded that uncontrolled sheep grazing is detrimental to forest regeneration, certain soil conditions, and water flow. A history of early sheep grazing in Oregon is provided, as are the facts brought out by the investigation and recommendations concerning remedial measures for areas subjected to uncontrolled sheep grazing. An extensive description of early forest fires in the central and southern Cascades is provided, including their causes, relation to sheep grazing, and post-fire regeneration.
Keywords: Forest history/Historical document/Sheep grazing/Cascade Range Forest Reserve/Fire effects/Water yield/Range management.

161. **Coville, Frederick V. 1898**. Sheep grazing in the forest reserves. The Forester. 4 (2): 30-32.
Notes: A photocopy of an original.
Abstract: This article discusses some effects of unrestricted sheep grazing on public domain lands of the United States during the late 1890s, including reduction of forage production, soil erosion, damage to forest reproduction, and fire setting by sheep herders. The fire issue was addressed by fire control legislation passed on February 24, 1897. The author suggests that sheep grazing be forbidden on the forest reserves without a permit. Although many of that era thought that forest reserves should be managed like National Parks and that all uses except recreation be curtailed, the author asserts that those who established the reserves had in mind preservation of the reserves for use, not from use.
Keywords: Forest reserves/Grazing damage/Historical document/Sheep grazing.

162. **Coville, Perkins**. **1940**. Growing Christmas holly on the farm. Farmers' Bulletin No. 1693. Washington, DC: U.S. Department of Agriculture. 22 p. **Size**: 6" x 9".
Notes: An original copy. Issued in October, 1932; this version is a slight revision released in September, 1940.
Abstract: The production of Christmas holly greens is a practical means of augmenting farm income in certain portions of the United States. The American and common English hollies do not grow rapidly, but normally are long lived and capable of producing greens for a century or more if properly managed. This bulletin describes methods of producing Christmas holly greens from the American and the English hollies and from rapid-growing varieties of the latter. The proper management of natural stands containing American holly is outlined. Practical details are presented about the care and handling of holly seeds, seedling culture, vegetative propagation, transplanting, field plantings, plantation maintenance, and the harvesting and marketing of greens.
Keywords: Christmas holly/Farm forests/American holly/English holly/Floral greens/Historical document/Leaf crops.

163. **Cowles, Henry C. 1901**. The influence of underlying rocks on the character of the vegetation. Bulletin of the American Bureau of Geology. 2: 163-176; 376-388. **Notes**: A photocopy of an original.
Abstract: This long article discusses the following topics: the chemistry and physics of soils, and the rocks and their vegetation. Many interesting examples of vegetation/geological correlations are described from all over the country, including relationships between rock types and undergrowth species such as shrubs and herbs.
Keywords: Forest influences/Historical document/Geology.

164. **Cowlin, R. W.; Briegleb, P. A.; Moravets, F. L. 1942**. Forest resources of the ponderosa pine region of Washington and Oregon. Miscellaneous Publication No. 490. Washington, DC: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 99 p. **Notes**: A photocopy of an original.
Abstract: This publication synthesizes the results of forest surveys completed during the 1930s for the eastern parts of Oregon and Washington. It includes a discussion of the following topics: survey findings in brief; definitions and specifications associated with the surveys; description of the region; forest inventory statistics; forest depletion statistics; forest growth statistics; land use statistics; forest protection measures; forest industries in the area; forest management practices; timber supply statistics; and a summary of regional forest problems. An extensive appendix and summary maps are also included. The authors offer interesting insights about stand conditions, as illustrated with this quote: the ponderosa pine type "is remarkably pure, averaging 94 percent ponderosa pine in Oregon and 92 percent in Washington. Stands are characteristically uneven-aged and open, with little heavy underbrush. The ground cover is chiefly grass or low shrubs."
Keywords: Forest inventory/Forest mapping/Community development/Eastern Oregon/Eastern Washington/ Historical document.

165. **Cox, William T. 1911**. Reforestation on the national forests. Part I: collection of seed. Part II: direct seeding. Bul-

letin No. 98. Washington, DC: U.S. Department of Agriculture, Forest Service. 57 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: The first of two bulletins describing early reforestation efforts on the National Forests. Topics discussed include: present conditions on the National Forests as related to reforestation; collection of seed, including seed collection, extraction, testing, and storage; and direct seeding, including site selection, time of year for implementation, seeding method (broadcasting versus strips, blocks or spots), quantity per acre to sow, protection from rodents, livestock and fire, sowing costs, and a description of successful direct seeding experiences. Successful experiences included the Olympic, Oregon (Mt. Hood), and Siuslaw National Forests in the Pacific Northwest.
Keywords: Artificial regeneration/Direct seeding/Seed collection/Animal damage control/Historical document.

166. **Cox, William T. 1928**. When forest fires began. American Forests. 34 (8): 477-479.
Notes: A photocopy of an original.
Abstract: This interesting article maintains that severe forest fires are not due to climate, but to near eradication of beaver throughout much of the western and north-central portions of the United States. The author states that activity of the industrious beaver was responsible for maintaining moist forest conditions on a surprisingly large proportion of the forested landscape, since their dams affected even the smallest streams and rivers. With the advent of the pervasive trapping era and virtual disappearance of the beaver over large portions of its historical range, forests became drier than they had been during the last thousand years. The moist, boggy conditions created by beaver activity served to keep fires small and innocuous, with few large fires ever developing. Cox also speculates that moist conditions would have promoted a healthier, more vigorous forest cover, so that insect-caused mortality, and its resulting fuel loading, would have been reduced.
Keywords: Fire ecology/Forest fires/Historical document/Beaver.

167. **Craighead, F. C.; Miller, J. M.; Evenden, J. C.; Keen, F. P. 1931**. Control work against bark beetles in western forests and an appraisal of its results. Journal of Forestry. 29: 1001-1018. **Notes**: A photocopy of an original.
Abstract: Did early control work against bark beetles make economic sense? As of 1930, approximately one million dollars had been spent on a number of bark beetle control projects. This article discusses the economics of control work and is a candid appraisal of what the money had bought in terms of values saved and of experience gained for guiding future control efforts. With bark beetles still considered to be important factors in the forests of the western United States, the authors believed that the recommendations they offered for control policies were particularly timely. In addition to its description of bark-beetle control policy, this article provides a good historical summary of historical control projects, including the first known effort to control mountain pine beetle in lodgepole pine forests – the Whitman National Forest project of 1910 and 1911. This long article includes the following sections: introduction; the western pine beetle; the western pine beetle in the Pacific Coast states (infestation types, history of control work, and conclusions and recommendations for control policy); the western pine beetle in the northern Rocky Mountain region (conclusions and recommendations for control policy); the southwestern pine beetle in Arizona and New Mexico (history of control work, conclusions and recommendations for control policy); the mountain pine beetle; the mountain pine beetle in lodgepole pine in the northern Rocky Mountain region and east of the Cascades (history of control work, conclusions and recommendations for control policy); the mountain pine beetle in the white pine type in the northern Rocky Mountain region (history of control work, conclusions and recommendations for control policy); the mountain pine beetle in sugar pine in California and Oregon (history of control work, conclusions and recommendations for control policy); the mountain pine beetle in the yellow pine type in the northern Rocky Mountain region; the mountain pine beetle in lodgepole pine in the Sierra Nevada region (history of control work, conclusions and recommendations for control policy); the mountain pine beetle in the western yellow pine type in California; the Jeffrey pine beetle in Jeffrey pine in California; the Douglas fir beetle in the northern Rocky Mountain region; and the Black Hills beetle in the central Rocky Mountain region and the Colorado Plateau (history of control work, conclusions and recommendations for control policy).
Keywords: Historical document/Ponderosa pine/Bark beetles/Mountain pine beetle/Western pine beetle/Douglas-fir beetle/Eastern Oregon/Northern Rocky Mountains/Southwestern United States/Jeffrey pine/Whitman NF/Jeffrey pine beetle/Black Hills beetle/Insect control/Insect damage.

168. **Dahl, Harold A. 1992**. 60 years – a forester looking back. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 53 p. **Notes**: A photocopy of an original.
Abstract: This accession consists of the reminiscences of an early forester whose entire career was spent in the Pacific Northwest, much of it with the Forest Service. Dahl attended the Oregon Agricultural College, when he worked seasonally as a fire lookout, and was then assigned to the Western Range Survey out of Pendleton, Oregon, eventually working in a variety of timber management, reforestation, and silviculture positions on the Deschutes, Fremont, Whitman, Gifford Pinchot, and Mt. Hood National Forests. He then worked in the Regional Office, even-

tually retiring as Chief of the Section of Silviculture in August of 1970. This report includes the following sections: early experience; silviculture experiences; field instructions and handbooks; timber harvesting methods; weather hazards to reforestation; soil and water problems; examples of training needs; and conclusion. Although the report mentions appendix material once or twice, which apparently were copies of older Forest Service memorandums relating to reforestation, the copy in the history archives was without any appendixes. In particular, Dahl was known as a pioneer in many aspects of the reforestation program in Region 6.
Keywords: Artificial regeneration/Forest history/Forest management/Deschutes NF/Fremont NF/Mt. Hood NF/ Silviculture/Timber management/Gifford Pinchot NF.

169. **Dana, Samuel T. 1918**. Forestry and community development. Bulletin No. 638. Washington, DC: U.S. Department of Agriculture. 33 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Provides a history of forest mismanagement in the late 1800s and early 1900s. Photographs, newspaper articles, and personal accounts are used to describe the detrimental effects on local communities of a forest industry whose normal operating procedure was to "cut out and get out." The movement of forest industry from one section of the country to another was chronicled; such movement occurred mostly in an attempt to find new timber supplies after they had been depleted in a region. The last portion of the bulletin offers some recommendations for improving the situation, including development of a stable forest policy for the country, and more public regulation and ownership of timber lands.
Keywords: Forest policy/Community development/Forest history/Historical document.

170. **Darlington, H. T. 1915**. A study of grazing conditions in the Wenaha National Forest. Bulletin No. 122. Pullman, WA: State College of Washington, Agricultural Experiment Station. 18 p. **Size**: 6" x 9".
Notes: A photocopy of an original.
Abstract: The principal forage plants of the higher part of the Wenaha NF are perennial, consisting mostly of shrubs. With the exception of the tops of some ridges, there seems to be no deterioration in the grazing areas. The tops of the ridges are being used as highways for the sheep. On account of snow, the range is limited to about 5 months of grazing, which is helping to hold down grazing impacts. An inventory of the relative distribution and abundance of principal forage plants should be made occasionally to indicate if any undesirable plant succession is occurring. The full carrying capacity of the range is not being used. A more complete utilization of the range would require development of additional sheep trails. So far as the regulation of the sheep industry and the enforcement of law and order are concerned, Government leasing to single individuals has been a marked success.
Keywords: Range management/Wenaha NF/Umatilla NF/Pomeroy RD/Sheep grazing/Historical document.

171. **Daubenmire, R. F. 1943**. Vegetational zonation in the Rocky Mountains. The Botanical Review. 9 (6): 325-393.
Notes: A photocopy of an original.
Abstract: This is a classic and important article in the ecological literature of that era. It discusses vegetation zones of the northern Rocky Mountains. The basal plains from which the Rockies rise are arid, and support only desert and grassland vegetation. The height to which the mountain masses rise brings about sufficient precipitation on their intermediate slopes to support forests of needle-leaved coniferous trees. This forest vegetation may be subdivided into five distinct altitudinal zones, each characterized by a climax association which, when well developed, occupies about 2,000 feet of vertical elevation. On the higher peaks and ridges above the forest zones, a tundra vegetation is found. The zonation of Rocky Mountain vegetation depends upon differences among species with respect to their limits of tolerance for climatic variation, and upon gradients in climatic factors, chiefly temperature and moisture, from the bottom to the top of a mountain slope. For the most part, the upper elevational limits of individual species seem to be determined by their relative physiological tolerance of temperature during the growing season. Upper timberline is usually caused by physiological drought conditions resulting from a combination of high wind velocities and cold soil. The lower altitudinal limits of species or zones seems to be related to drought (moisture). Within the elevational range where a major plant association is best developed, it is the climatic climax and occupies a wide variety of habitats. Toward its upper limits the same association characteristically becomes a topographic climax restricted to warm south-facing slopes, and may serve in a seral capacity following disturbance on other habitats. At its lower limits, an association may play the role of a topographic or edaphic climax when restricted to the most mesic habitats at that elevation. At intermediate elevations in the mountains, slope exposure and soils may be of more significance in determining the local distribution of species than is elevation. Zones decrease in elevation above sea level with increasing latitude, although the elevation-latitude relationship is not linear. Typical patterns of zonation may be interrupted in any of several ways. Lower zones may be lacking due to soil factors elevating the lower timberline. Upper zones may not be represented on a mountain because of insufficient height of the range. This article contains the following sections: introduction; the zones (alpine, spruce-fir, Douglas-fir, ponderosa pine, juniper-pinon, and oak-mountain mahogany); mountain environment; etiology; altitude versus latitude;

irregularities in the zonal pattern; summary; and literature cited. This article concludes with an extensive and informative literature cited section containing references to 175 pieces of ecological literature.
Keywords: Alpine zone/Historical document/Plant ecology/Northern Rocky Mountains/Vegetational zonation/ Plains zone/Foothills zone/Montane zone/Subalpine zone.

172. **Davies, K. G. 1961**. Peter Skene Ogden's Snake Country journals; 1826-27. London, U.K.: The Hudson's Bay Record Society. 10 p. **Notes**: A photocopy of an original.
Abstract: In 1950, the Hudson's Bay Record Society began publishing Peter Skene Ogden's Snake Country journals (see Rich and Johnson 1950 for an excerpt from that work). Ogden's journals gradually became important as an early source about the history of the American West. This accession consists of selected pages copied from a larger work. It provides journal material from an early fur trapper who was persistent and resourceful in his pursuit of beaver. Ogden worked for the Hudson Bay Company, who controlled much of the beaver trade in western North America. He was characterized as a shrewd observer of human nature, based on his comments about his party members, the American Indians he met, and upon himself. Pages 10-19 describe Ogden's travels as he headed southeast from the South Fork of the John Day River across Izee to the Silvies River and then south to Harney and Malheur Lakes. This section covers journal notes from Thursday, October 6th, 1826 (at the South Fork of the John Day River) to Tuesday, November 1st, 1826 when he was at Harney and Malheur lakes. Pages 124-129 describe his return on a northward trip, when he travelled north from Harney Lake to the head of the Silvies River, then east to Malheur River and Drewsey, and then southeast to Juntura. That section covers journal entries from Monday, June 4th, 1827 to Thursday, July 5th, 1827 when he reached Juntura. The journal entries in this material recount climatic conditions, beaver trapping activities, big-game accounts, and interactions with American Indians.
Keywords: Eastern Oregon/Historical document/Explorer journals/Peter Ogden/Fur trapping/Hudson Bay Company.

173. **Davis, E. M. 1942**. Machining and related characteristics of southern hardwoods. Technical Bulletin No. 824. Washington, DC: U.S. Department of Agriculture. 42 p. **Size**: 6" x 9".
Notes: An original copy. Issued in May, 1942.
Abstract: Machining properties relate to the behavior of a wood when planed, shaped, turned, or put through any of the standard woodworking operations. Wood in general is easy to cut, shape, and fasten. For some purposes, the difference between woods in machinability is negligible, but for others it may be the most important of the wood's properties. Some of the everyday working qualities and machining characteristics of American hardwoods were studied at the Forest Products Laboratory, and this bulletin reports the results of that work for selected southern species. It contains the following sections: introduction; machining properties; related properties; and summary.
Keywords: Woodworking/Wood characteristics/Southern hardwoods/Historical document.

174. **Davis, Kenneth P. 1942**. Economic management of western white pine forests. Technical Bulletin No. 830. Washington, DC: U.S. Department of Agriculture. 77 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is one in a series of bulletins describing management of western white pine stands in the Inland Empire region of northern Idaho, northeastern Washington, and northwestern Montana. The following topics are discussed: rotation and financial policy, including market characteristics and growth capacity; timber management problems associated with varying types of white pine stands; and a case study demonstrating how the economic principles covered in this bulletin could be applied to an actual situation.
Keywords: Western white pine/Inland Empire/Northern Idaho/Northeastern Washington/Northwestern Montana/Economics/Historical document.

175. **Davis, Raymond E. 1941**. Elementary plane surveying: text and manual. New York, NY: McGraw-Hill Book Company, Inc. 464 p. **Size**: 5" x 7½". **Notes**: An original copy; second edition, tenth impression.
Abstract: This book supersedes one published by the author in 1915 and entitled "Manual of surveying for field and office." It was designed to be used as a text for surveying courses offered to students in architecture, forestry, and electrical and mechanical engineering. It contains text for the classroom and a manual of exercises for both field and office. The essentials of measuring, calculating, and mapping are covered in this book. The following chapters are included: field and office work; errors; measurement of distance; measurement of difference in elevation; differential leveling; profile leveling, cross sections, grades; plotting profiles and cross sections, volumes of earthwork; measurement of angles and directions; the engineer's transit; transit-type surveys; stadia surveying; triangulation of ordinary precision; map drafting; map plotting; calculation of areas of land; topographic maps; the plane table; topographic surveying; route surveying; land surveying; determination of latitude and azimuth; references; tables; and index.

Keywords: Forest inventory/Forest mapping/Forest measurements/Historical document/Land surveying.

176. **Dayton, W. A., editor**. **1937**. Range plant handbook. Unnumbered Report. Washington, DC: U.S. Department of Agriculture. Variable p. **Size**: 7" x 9". **Notes**: An original copy. The history archives also contains two large-format (8½" x 11") reprintings produced by the National Technical Information Service.
Abstract: This is a small-format, loose-leaf handbook designed for field-going persons who are not specialists in botany. It has two purposes: 1) to evaluate in a succinct, understandable, complete, and usable form the relative importance of more than 300 outstanding "key" plants of western ranges with regard to grazing, watershed protection, recreation, and other uses; and 2) to enable the ready field identification of each plant to ensure that management data is associated with the appropriate species. It includes the following sections: introduction; grasses; grasslike plants; range weeds; browse; and an index. Virtually every species is illustrated, in most instances with a high-quality line drawing, but in others with a black-and-white photograph or, rarely, a color drawing. This handbook provides detailed narratives for 339 plants, although notes are included for an additional 500 species. The main treatment includes 98 grasses, 8 grasslike plants (chiefly sedges and rushes), 137 range weeds (non-grasslike herbs), and 96 browse plants (shrubs and trees). The narratives accompanying each species provide many management implications, such as palatability for livestock, value as wildlife forage, geographical distribution, history, and cultural significance.
Keywords: Grasses/Historical document/Indicator plants/Livestock forage/Plant identification/Poisonous plants/Range management.

177. **Dayton, William A. 1960**. Notes on western range forbs: Equisetaceae through Fumariaceae. Agriculture Handbook No. 161. Washington, DC: U.S. Department of Agriculture, Forest Service. 254 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: Annotated range plant collecting by the Forest Service began in 1907. The earliest collections, however, were deposited in the United States National Herbarium. In 1910, the Forest Service Herbarium in Washington DC was started. Serial numbering of plants deposited in the Forest Service Herbarium started on August 4, 1911. At the time this handbook was prepared, there were over 125,000 specimens in the Forest Service Herbarium. In general, forbs were not considered to be as important as grasses as range forage, but their great number, diversity, and ubiquity caused them to be of great importance to both livestock and wild ungulates such as deer and elk. The genera and species of forbs included in this handbook were considered to represent about one-fourth of the range forbs in the eleven far-western states. Not only does this guide provide detailed descriptions for each species, but many are illustrated with a high quality black-and-white photograph or line drawing.
Keywords: Botany/Historical document/Plant identification/Livestock forage/Western United States/Forbs.

178. **Dealy, J. Edward**. **1960**. The densiometer for measurement of crown intercept above a line transect. Research Note Number 199. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 5 p. **Notes**: An original copy.
Abstract: An adaptation in the use of Lemmon's spherical densiometer was developed to measure low overstory crown foliage as intercept above a line transect. The method described appears to be an effective working tool for ecological studies involving tall shrubs and small trees. It provides precise and accurate estimates of crown cover, requires little instrumentation, and is simple and rapid in its operation. Results of tests reported here and subsequent field trials indicate that this method could easily be adapted to vegetation types containing plant species of intermediate height.
Keywords: Crown closure/Spherical densiometer/Canopy cover/Forest measurements/Historical document.

179. **Department of the Army, Corps of Engineers**. **1948**. Review report on Columbia River and tributaries; appendix I: middle and lower Snake River basin. Unnumbered, Unpublished Report. Portland, OR: Department of the Army, Corps of Engineers, North Pacific Division, Portland District. 316 p (plus tables and figures).
Notes: An original copy.
Abstract: This appendix describes the area drained by streams that enter Snake River between its confluence with Columbia River and a point about midway between the mouth of Burnt River and Weiser, Idaho. An additional area of approximately 1,100 square miles of potentially irrigable land lying northeast of Pasco, Washington (referred to as the Esquatzel Coulee) but outside the actual Snake River drainage basin was also included in this study. The study area included about 40,000 square miles, of which about 25,300 square miles are in central Idaho, 8,300 square miles in northeastern Oregon, and 6,400 square miles in southeastern Washington. The Idaho-Montana boundary along the crest of the Bitterroot Range forms the sub-basin boundary on the east. The southern boundary is formed by the Salmon River drainage basin, the Sawtooth Mountains, the southern extension of the Seven Devils Mountains, and the southern limits of the Burnt River drainage. The western boundary follows the summit of the

Blue Mountains in Oregon and Washington. The northern boundary is formed by the Esquatzel Coulee and the Palouse River and Clearwater River drainage basins. This appendix consists of two parts. Part I includes three chapters, as follows: chapter I is general data and includes section I – description and section II – economic development. Chapter II is problems and solutions and includes section I – introduction; section II – field and office studies; section III – general problems; section IV – Snake River (Hells Canyon project, Nez Perce project, Asotin project, Clarkston project, open-river navigation channel above Lewiston, and improvements below Lewiston); section V – Burnt River (description, possible future projects, and conclusion); section VI – Powder River (description and possible future projects); section VII – Imnaha River (description and possible future projects); section VIII – Salmon River (description, proposed crevice project, proposed freedom project, proposed local flood control project, possible future projects, and conclusion); section IX – Grande Ronde River (description, proposed local projects, possible future projects, and conclusion); section X – Asotin Creek; section XI – Clearwater River (description, proposed Kooskia project, proposed Elkberry project, proposed Bruces Eddy project, proposed local flood control projects, possible future projects, and conclusion); section XII – Palouse River (description, proposed local projects, and conclusion); section XIII – minor tributaries. Chapter III is summary and includes section I – summary of projects; section II – accomplishments; and section III – conclusions. Part I also contains 31 tables, eight charts, 44 plates, and 3 illustrations. Part II is special studies and consists of five sections, as follows: section I – precipitation characteristics; section II – cost estimates; section III – siltation; section IV – evaporation; and section V – ice in connection with water resource development. This appendix recounts historical floods and describes some of the causal factors for them, as well as flood-control projects designed to prevent or mitigate future floods. There is a wealth of information provided in this document, not just about the natural resources of the Snake River sub-basin, but also about its social, economic, and cultural characteristics.
Keywords: Agriculture/Floods/Historical document/Snake River/Watershed management/Flood control/Land use planning/Burnt River/Powder River/Imnaha River/Salmon River/Grande Ronde River/Asotin Creek/Clearwater River/Palouse River/Columbia River/Esquatzel Coulee.

180. **Department of the Army, Corps of Engineers**. **1948**. Review report on Columbia River and tributaries; appendix K: minor tributaries below Yakima River. Unnumbered, Unpublished Report. Portland, OR: Department of the Army, Corps of Engineers, North Pacific Division, Portland District. 267 p (plus tables and figures).
Notes: An original copy.
Abstract: This appendix describes the areas drained by Columbia River tributaries downstream from Yakima River to and including Cowlitz River on the north, and from Snake River downstream to and including Sandy River on the south. The study area included a total of 32,300 square miles, of which 7,710 square miles lie to the north of the Columbia River in the state of Washington, and 24,590 square miles lie to the south of the River, mostly within the state of Oregon. This appendix consists of two parts: part I is sub-basin data, whereas part II is special studies. Part I consists of three chapters, as follows: chapter I is general data and includes section I – description and section II – economic development; chapter II is problems and solutions and includes section I – general (introduction, field and office studies, and general problems) and section II – projects considered (lower Columbia River fishery plan, Walla Walla River, Umatilla River, Willow Creek, John Day River, Alkali Canyon, Deschutes River, Fifteenmile Creek area, Klickitat River basin, Hood River, White Salmon River, Little White Salmon River, Sandy River, Lewis River, Cowlitz River, and miscellaneous minor streams); chapter III is summary and includes section I – summary of projects and section II – conclusions. Part I also contains 24 tables, six charts, and 36 plates. Part II is special studies and consists of six sections, as follows: section I – precipitation characteristics; section II – cost estimates; section III – siltation; section IV – evaporation; section V – spillway design floods; and section VI – lower Columbia River fishery plan. This appendix recounts historical floods and describes some of the causal factors for them, as well as flood-control projects designed to prevent or mitigate future floods. There is a wealth of information provided in this document, not just about the natural resources of the sub-basin, but also about its social, economic, and cultural characteristics.
Keywords: Agriculture/Floods/Historical document/Walla Walla River/Watershed management/Flood control/Land use planning/Umatilla River/John Day River/Willow Creek/Alkali Canyon/Deschutes River/Fifteenmile Creek/Klickitat River/Hood River/White Salmon River/Little White Salmon River/Sandy River/Lewis River/Cowlitz River/Columbia River.

181. **Dimock, Edward J. II**. **1957**. A comparison of two rodent repellents in broadcast seeding Douglas-fir. Research Paper No. 20. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 17 p. **Notes**: An original copy.
Abstract: Test areas on the Olympic and Siuslaw National Forests were successfully restocked with Douglas-fir after broadcast seeding. Results were best when seed was treated with a chemical rodent repellent, and poorest when seed was untreated. Endrin and tetramine, the two repellents being tested, were inconsistent in their effectiveness.

More refined experimental techniques and increased replications are probably necessary for successful broadcast seeding trials.
Keywords: Olympic NF/Siuslaw NF/Animal damage control/Rodent repellents/Coastal Douglas-fir/Artificial regeneration/Historical document/Broadcast seeding.

182. **Dodds, J. S.; McKean, J. P.; Stewart, L. O.; Tigges, G. F. 1943**. Original instructions governing public land surveys of Iowa. Ames, Iowa: Iowa Engineering Society. 564 p. **Size**: 6.5" x 9".
Notes: A photocopy of an original.
Abstract: This document does not include all of the original book; only pages 117 to 195 were copied. That portion of the book, entitled "Instructions to the surveyors general of public lands of the United States for those surveying districts established in and since the year 1850; containing also, a manual of instructions to regulate field operations of deputy surveyors, illustrated by diagrams," is a reprint of the original instructions pertaining to public land surveys. They were initially published by the General Land Office (A. O. P. Nicholson, public printer) in Washington, DC in 1855. It was copied because some of the early GLO land survey notes pertaining to the Umatilla NF were probably prepared using these instructions. They cover the following topics: system of rectangular surveying; of measurements, chaining, and marking; marking lines; witness points; establishing corner boundaries; bearing trees; mounds; the meandering of navigable streams; field books; affidavits to field notes; method of subdividing; and variation of the needle. The section also includes 2 example or specimen field notes – one for the exterior lines of a township, and another for the subdivisions of the same township. The last 8 pages of the document is entitled "Comments of W. D. Jones" and it provides an informative history of the land survey system of the United States. It also discusses bearing trees and witness trees, and the running of lines.
Keywords: General Land Office/Historical document/GLO survey notes/Land surveying.

183. **Donk, M. G.; Shattuck, C. H.; Marshall, W. D. 1921**. The distillation of stumpwood and logging waste of western yellow pine. Bulletin No. 1003. Washington, DC: U.S. Department of Agriculture. 69 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This comprehensive report examines the extent of ponderosa pine forests in the western U.S., and assesses the opportunities to use stumpwood and other logging waste to distill turpentine. The products obtained from distillation are described, and the feasibility of distillation using small, semi-portable wood-distilling plants is evaluated.
Keywords: Distillation/Turpentine production/Ponderosa pine/Logging residue/Historical document.

184. **Dosch, Arno**. **1906**. The war for range. The Pacific Monthly. 15 (2): 153-160.
Notes: A photocopy of an original.
Abstract: This interesting article discusses early struggles between cattlemen and sheepmen. It provides a history of the conflict between cattle and sheep grazing in the western United States, including establishment of a "dead line" in most states past which sheep did not pass. It also describes bloodshed that occurred on the south fork of the John Day River and near Canyon Creek, areas where cattle and sheep grazers had armed clashes over grazing rights. Those clashes eventually established an early dead line stretching from Bear Valley in Grant County to the end of the Blue Mountains in Crook County. Other range wars are also described, most of which result in the "open handed, open minded" cattlemen eradicating the sheep "vermin" from their country.
Keywords: Range history/Cattle grazing/Blue Mountains/Central Oregon/Eastern Oregon/Grazing/Historical document/John Day River/Grant County OR/Range management/Sheep grazing.

185. **Drake, George L. 1920**. Timber sale report: Looking-glass Creek area. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 6 p. **Notes**: An original copy, including a multi-color map. A digital version of this report is available; filename: Wenaha2.
Abstract: This report describes an area that was examined after the Grande Ronde Lumber Company of Perry, Oregon applied for a timber sale in the Lookingglass Creek area. This report includes the following sections: description of the tract; estimate of timber volume; private interests; agricultural lands; silvical description (merchantable timber, reproduction, undergrowth, soil); silvical system recommended; accessibility; operating methods; market; appraisal; and general information. The report includes a multi-color reconnaissance map of the area showing the boundary of the area applied for, and some general vegetation types (yellow pine, larch-Douglas-fir-white fir, and open areas).
Keywords: Historical document/Lookingglass Creek/Umatilla NF/Blue Mountains/Timber sales.

186. **Dunning, Duncan**. **1923**. Some results of cutting in the Sierra forests of California. Bulletin No. 1176. Washington, DC: U.S. Department of Agriculture. 24 p. **Size**: 6" x 9".

Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This early bulletin describes the results of a study initiated in cutover areas in the national forests of California. Growth of the residual stand is discussed in relation to site quality, species, size and age limits, crown size and form, and degree of cutting. Growth acceleration and net growth after cutting is also discussed. Injurious agents, reproduction, and the value of timber increment on the cutover areas is described. It provides some interesting insights about forest succession, as illustrated with this quote: "Where natural conditions of site favor white fir, this species is destined to succeed yellow pine unless the normal succession is disturbed by fire or other accidents. Fir seeds germinate more abundantly than pine under stands of yellow pine, whose litter and shade exclude their own seedlings, and the young [fir] trees endure suppression longer. Moreover, height growth of fir is more rapid, and the total height attained is greater than for yellow pine. In the past occasional fires have been primarily responsible for sustaining yellow pine on fir sites. Fir seedlings and young trees are far more susceptible to fire damage than the pine because of their thinner bark with balsam cysts, more inflammable foliage, and small resinous terminal buds which are far less resistant than those of yellow pine. The fir is more often eliminated by fungi entering through fire scars than is pine. Exposure of mineral soil and openings created by fire favor yellow pine. Striking examples of the succession of white fir with fire exclusion may be seen in many places, where the mature stand is composed of practically pure yellow pine, while the reproduction beneath it is over 90 per cent white fir."
Keywords: Sierra Nevada Mountains/Partial cutting/California/Historical document.

187. **Dutton, W. L. 1931**. Lonerock Driveway. Photo Number 255871. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Size**: 3" x 5½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is attached to an 8" x 9" camera point study report form (Form R6-E13). Information from the form includes these items: CPS # 28; date: 4/14/31; location: Lonerock Driveway; photo no. 1; light: good; picture taken by: W. L. Dutton; description of scene, bringing out salient points of study which will make it of value for future reference – attach additional sheet if necessary: "Photograph #255871 taken April 14, 1931 by W. L. Dutton. Lonerock driveway. Typical scab rock ridge.".
Keywords: Umatilla NF/Historical photograph/Lonerock Driveway.

188. **Dutton, Walt L. 1931**. Bull Prairie Ranger Station. Photo Number 255838. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Bull Prairie. **Size**: 3" x 5". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is attached to an 8" x 9" camera point study report form (Form R6-E13). Information contained on the form includes these items: CPS # 21; date: 4/14/31; location: Bull Prairie; photo no. 1; light: good; picture taken by: W. L. Dutton; description of scene, bringing out salient points of study which will make it of value for future reference – attach additional sheet if necessary: "Photograph #255838 taken April 14, 1931 by Walt L. Dutton. Bull Prairie R. S.".
Keywords: Bull Prairie Ranger Station/Umatilla NF/Historical photograph/Heppner RD.

189. **Eastman Kodak Company**. **1979**. Preservation of photographs. Rochester, New York: Eastman Kodak Company. 61 p. **Notes**: An original copy.
Abstract: This item is included in the history archives not because of its age, but because it deals with the preservation and care of historical photographs, many of which are contained in the archives. It was written for those who care for negatives and prints from the past – providing information about their preservation; tips on restoration and repair of deterioration; and suggestions about how to improve conditions under which collections are stored. Kodak has assembled the best advice it can offer on the preservation of still photographs, primarily those in black-and-white. Since the chemical deterioration of black-and-white photographs is a relatively slow process, the work of preservation and restoration is not usually urgent. However, old collections that still contain early film negatives on a nitrate base, which was an inherently unstable material, should be duplicated as soon as possible due to safety concerns. This informative booklet contains the following chapters: structure of photographic materials; causes of deterioration; processing for stability; print stability procedures; storage conditions; air conditioning; storage materials; storage of films and plates; negatives on nitrate base; paper prints; preserving color photographs; photographic collections; duplicating and copying; stain removal; and an appendix.
Keywords: Photography/Historical preservation.

190. **Eaton, C. B.; Beal, J. A.; Furniss, R. L.; Speers, C. F. 1949**. Airplane and helicopter spraying with DDT for spruce budworm control. Journal of Forestry. 47: 823-827. **Notes**: A photocopy of an original.
Abstract: This article describes an experimental control project against western spruce budworm on 4,200 acres of defoliated mixed-conifer forest on the Umatilla National Forest and on lands owned by the Kinzua Pine Mills Com-

pany of Heppner, Oregon. Aerial surveys in 1948 showed that almost 1,500,000 acres of mixed-conifer forest in eastern Oregon and Washington were infested with western spruce budworm. Several experiments involving an insecticide called DDT were in progress against budworm in New York state and eastern Canada, and it was proposed to try DDT as a control agent against budworm in the Blue Mountains area. An area of 6,300 acres was delineated within a larger, 160,000-acre infestation affecting the Heppner Ranger District for an experimental application of DDT during the later half of June in 1948 (the infested area ranged from Swale Creek on the east to the Spray-Heppner highway on the west). The experimental area consisted of a two-storied stand of the mixed fir-ponderosa pine type, with Douglas-fir and grand fir comprising about 20% of the merchantable overstory but a considerably higher percentage of the understory. The experiment included 14 plots of 350 acres each, with twelve plots treated and 2 plots untreated as controls (all of the plots were situated within a 5-mile radius of Opal Butte). The insecticide was an oil solution of DDT mixed at a rate of 1 pound of technical grade DDT in 1.2 quarts of a hydrocarbon auxiliary solvent diluted to 1 gallon with fuel oil. Five combinations of dosage and application method were involved in the experiment: 1/2 pound DDT per acre applied by helicopter; 1 pound DDT per acre applied by helicopter; 1 pound DDT per acre and applied by helicopter in a criss-cross pattern; 1 pound DDT per acre applied by airplane; and 2 pounds DDT per acre applied by airplane. Insecticide was applied between June 22nd and July 2nd of 1948. One interesting aspect of the experiment was a new technique for marking the corner trees of each plot – it involved shooting a line over the trees (100 to 140 feet tall) with a line-throwing shoulder gun, and then using the line to haul up a paint bomb consisting of a quart of aluminum paint in a fiber container in which was inserted a detonator and one quarter of a stick of dynamite. The paint bomb was electrically detonated from the ground, with the explosive force effectively distributing the paint throughout the upper tree crown. The tree crown was visible for some distance from the air, but no apparent damage was caused to the tree. Daily measurements of the budworm larvae and the tree foliage were made to insure that the treatments were applied when the insect was most vulnerable. The results of the experimental applications were impressive. The three airplane plots sprayed with the one-pound dosage showed an average control of 99.6%. The plots sprayed with the 2-pound dosage had a control rate of 99.5%. Plots sprayed by helicopter had a lower control rate than those sprayed with an airplane, ranging from 91.2% to 98.6%. The one plot sprayed with one-half pound of DDT per acre (an error) showed a control rate of only 68.3%. No foliage burning from the spray mixture was noted on any of the treated plots. Treated trees showed an immediate response, with Douglas-fir greening up within three weeks of the spraying.
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Heppner RD/DDT/Kinzua Lumber Company/Insect control.

191. **Edmonston, W. D. 1913**. 1912 report on northeastern Oregon project no. 38. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Entomology, Branch of Forest Insects. 29 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: A mountain pine beetle outbreak occurred in ponderosa and lodgepole pines in the northern Blue Mountains and Wallowa Mountains in the early 1900s (beginning no later than 1905, according to the figures in this report). This report describes an examination of the areas that received pine beetle control treatments in 1911 (control work began on April 5th and was completed on June 30th), not only to determine treatment effectiveness but to ascertain whether further control work was warranted. Although this report does not go into the outbreak history in much detail, it is surmised that this control project was one of the first of its kind, at least for northeastern Oregon and possibly the entire western United States. A. D. Hopkins, a preeminent entomologist of that era, states that "the project must be considered as a big experiment." This report includes the following sections: general instructions for inspection of the area; special instructions and introduction; tree table for camp areas; totals for camp areas; totals for district areas or units; resume, diameters, heights; acreage; diameters; totals for entire area, *Dendroctonus* species; number of saplings; results and percentages; volume in board feet; lodgepole pine rate of infestation; check area, showing percentages and increase; lodgepole pine in the adjacent untreated areas; the southern Wallowa (Minam National Forest); and map of treated areas. It appears that the 1912 project was completed entirely by the Bureau of Entomology, since the author states early on in the report that "it was expected and understood that the Forest Service would cooperate and assist in making the examination. It will be sufficient to state that they did not do so; nor did they render any assistance in any way whatsoever." A series of tables summarizes the field survey, with results reported by "camp:" Anthony Creek, Big Gulch, Bulger Flat, North Powder River, Muddy Creek, Pine Creek, Marble Creek, Hibbard Gulch, Elk Creek, Poker Creek, Union Creek, Miners Creek, Deer Creek, Sheep Creek, Snow Ball, White Face, Sumpter, Slim Creek, Cracker Creek, Fruit Creek, Silver Creek, Sheep Rock, and Cold Springs. A summary tables shows that 76,430 acres were examined and that 12,219 yellow pines (ponderosa pine) and 16,279 lodgepole pines were treated on those acres. The number of red-top and current-year infested trees are also provided for each of the tree species. The "Baker Forest Protective Association" presumably represented private lands in the outbreak area – figures for treated and infested trees for their portion of the outbreak area are also provided in the tables. The summary showed that 14,483 yellow pines had been treated (counting private lands)

as compared to 3,083 newly-infested trees, representing a reduction of almost 79%. The corresponding reduction for lodgepole pine was almost 92% (treated: 20,007; new infested: 1,615). The outbreak was still quite heavy in untreated lodgepole and whitebark pine stands as of 1912: the author judged that at least 200,000 infested lodgepole and whitebark pines existed between 5,000 and 7,000 feet elevation in an area ranging from Anthony Creek on the north to Elk Creek on the south, and then west to the Elkhorn Range. The Whitman National Forest map that accompanies this report (dated 1912) shows the treatment and infestation areas in color; it was copied on 8, 8.5" x 11" sheets since the National Archives did not have large-format color copying capability.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Minam NF/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa NF/Wallowa-Whitman NF/Whitebark pine/Whitman NF.

192. **Egleston, N. H. 1882**. What we owe to the trees. Harper's New Monthly Magazine. 64: 675-687.
Notes: A photocopy of the original article published in April, 1882.
Abstract: This article discusses the value of forests through the ages, and the consequences of forest destruction on ancient civilizations. The implications of forest loss to Greece, Rome, Carthage, Egypt, Spain, and other previous civilizations is described in great detail, including extensive quotes from similar works by George Perkins Marsh. The balance of this article discusses particular effects of forest denudation, such as floods or climate change, and then provides actual examples of those effects from "case study" areas located around the world.
Keywords: Forest influences/Climate/Deforestation/Historical document.

193. **Ellson, Arvid C. 1977**. Soil and water field trip: July 6–8. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6. 12 p. **Notes**: An original copy.
Abstract: This accession consists of a three-page memorandum and three associated reports. It describes the findings from a watershed field trip to the Umatilla NF on July 6-8, 1977. The goal of the field trip was to examine the soil and water programs of the Umatilla NF, with a particular emphasis on their involvement with project planning. Participants from the Regional Office included Arvid Ellson, Director of Watershed Management; R. T. Meurisse, Soils Group Leader; Gary G. Morrison, Geology Group Leader; and Gerald W. Swank, Water Management Group Leader. Participants from the Forest included Roger Baker, Curt Johnson, Earle Rother, and Ed Calame from the Supervisor's Office; Gerald Flanik, Don Hanson, and Al Skoglund from the Walla Walla District; Dave Dahl, Greg Johnson, and Bob Allen from the Dale District; and Dick Lemmon from the Pendleton District. The memorandum from Ellson summarizes important findings from the field trip; detailed information is contained in the attached reports: Soils (by Meurisse; 3 pages), Geologic Services (by Morrison; 2 pages), and Water (by Swank; 4 pages).
Keywords: Forest management/Geology/Soils/Watershed management/Multiple use management/Umatilla NF.

194. **Erickson, M. L. 1906**. Report: Blue Mountain Forest Reserve (E). Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Bluemtn4. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.
Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This forest reserve inspection report was prepared by an inspector from the District Office; it includes the following sections: timber sales (24 p.); products (1 p.); grazing (14 p.); claims and privileges (16 p.); additions and eliminations (3 p.); and personnel, equipment, and protection (37 p.)
Keywords: Historical document/Program administration/Blue Mountains Forest Reserve/Blue Mountains/Blue Mountains NF.

195. **Erickson, M. L. 1906**. Report on Blue Mountains (West) Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Bluemtn5. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.
Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This forest reserve inspection report was prepared by an inspector from the District Office; it includes the following sections: timber sales (22 p.); boundaries (5 p.); privileges and claims (5 p.); den-

drology (1 p.); planting (1 p.); products (2 p.); protection and equipment (19 p.); and allotments and expenses (3 p.). The Blue Mountains West Reserve included lands in the Malheur, Ochoco, Umatilla, and Deschutes (?) National Forests. It includes interesting insights about early conditions in the Blue Mountains, as illustrated with this quote: "The forest in the region south of the Strawberry range that bears excellent yellow pine and tamarack covers approximately 800,000 acres. The yellow pine is more abundant and is found in more suitable situations on this reserve than I have seen its occurrence in any other part of Oregon. It grows tall and straight, maintains a uniform taper, and furnishes a large percentage of clear length. Trees thirty to fifty inches in diameter, with height of 150 feet, are not uncommon."
Keywords: Historical document/Program administration/Blue Mountains NF/Blue Mountains Forest Reserve/ Malheur NF/Umatilla NF/Ochoco NF/Deschutes NF.

196. **Erickson, M. L. 1907**. Report on Chesnimnus Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Chesnim2. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.
Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This forest reserve inspection report was prepared by an inspector from the District Office; it includes the following sections: protection, equipment, personnel (16 p.); grazing (6 p.); boundaries (7 p.); timber sales (16 p.); claims (9 p.); planting (2 p.); privileges (7 p.); and products (2 p.).
Keywords: Program administration/Chesnimnus Forest Reserve/Blue Mountains/Historical document.

197. **Erickson, M. L. 1907**. Report on Heppner, Oregon, National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Heppner2. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.
Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This national forest inspection report was prepared by an inspector from the District Office; it includes the following sections: [timber] sales (10 p.); silvics (9 p.); grazing (24 p.); boundaries (2 p.); protection and improvement (27 p.); equipment (2 p.); and organization (13 p.). Erickson offers some interesting insights in this work, as illustrated by this quote: "Game is not at all abundant. The cause of the lack of deer and other game is probably due to the annual hunt of the Warm Springs and Umatilla Indians who come into the country en masse with large bands of horses. The Forest officers should see that each Indian complies with the game laws."
Keywords: Historical document/Program administration/Heppner NF/Umatilla NF/Blue Mountains.

198. **Erickson, M. L. 1906**. Report on Wallowa Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Wallowa1. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.
Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This forest reserve inspection report was prepared by an inspector from the District Office; it consists of a series of smaller documents covering the following topics: timber sales (9 p.); claims and privileges (4 p.); protection (10 p.); personnel (10 p.); and grazing (11 p.).
Keywords: Historical document/Forest management/Program administration/Wallowa Forest Reserve/Blue Mountains/Wallowa-Whitman NF.

199. **Erickson, M. L. 1907**. Supplementary report on Wallowa Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Wallowa6. Photocopy of an original located at the Pacific Northwest Region of the National Archives in Seattle, WA.

Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This forest reserve inspection report was prepared by an inspector from the District Office; it supplements information contained in Erickson's primary report on the Wallowa (1906). It includes the following sections: boundaries (3 p.); protection (3 p.); personnel and improvements (5 p.); timber sales (4 p.); and privileges (4 p.).
Keywords: Historical document/Program administration/Wallowa Forest Reserve/Blue Mountains/Wallowa-Whitman NF.

200. **Ericson, O. F. 1930**. Report on readjustment of stumpage prices; East Oregon Lumber Company. Unpublished Typescript Memorandum. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 4 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This memorandum describes a readjustment of stumpage prices for a timber sale on the Wallowa National Forest in which the purchaser was the East Oregon Lumber Company. The last timber contract was dated December 1, 1924. The last increase in stumpage price was made on March 1, 1924, at which time the price for western yellow (ponderosa) pine was increased from $2.50 per thousand board feet to $3.00 per thousand board feet. The original sale of the Mud-Davis Creek unit occurred on December 1, 1913 and was estimated to contain the following volumes: 102,000,000 board feet of western yellow pine; 10,000,000 board feet of Douglas-fir; 7,000,000 board feet of western larch; and 1,000,000 feet of lodgepole pine and other species for a grand total of 120,000,000 board feet. About 48,326,940 board feet was cut on the sale from 1916 to June of 1925. The old contract was then terminated and a new contract drawn up on December 1, 1924. The new contract contained the following volumes: 42,000,000 board feet of western yellow pine, and 7,500,000 of Douglas-fir and western larch, for a grand total of 49,500,000. The main reason for decreasing the total volume by approximately 22,000,000 feet between the 1913 and 1924 contracts was that the original estimate, based on an extensive grazing reconnaissance of the area, was too high. Logging operations ceased on the sale in August of 1927 and the company later went into the hands of a receiver. The total amount cut on the second sale was 34,044,290 board feet and was distributed among four species. Supervisor Billings submitted a map and estimate indicating that there was approximately 8 million board feet of yellow pine remaining on the sale area. Remaining volumes of other species were not estimated since their removal from the sale area was optional.
Keywords: Historical document/Timber measurements/Timber sales/Timber volume/Wallowa NF/East Oregon Lumber Company/Mud-Davis Creek timber sale.

201. **Ericson, O. F.; Conover, C. J. 1918**. Descriptive report: Upper North Fork timber survey project. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 10 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Five small forest areas totaling 2,015.92 acres, located in T. 10 S., R. 35½ and 36 E., and T. 11 S., R. 36 E. were cruised during March 1918. The examined areas were scattered over the upper part of the North Fork Burnt River drainage, except for part of the "Tipton chance" which lapped over the ridge and drains west to the John Day River. The areas were widely separated, so that each one comprised a separate logging chance. The chances varied in size from 80 to 1,050 acres and all were very accessible. All of the timber was tributary, by siding or spur, to the Sumpter Valley narrow-gauge railroad. A color map shows the location of the cruised areas, all of which were fairly close to Whitney in the Sumpter Valley. The examined areas consisted primarily of cancelled claims scattered among the patented (private) land in the valley. The yellow pine type covered 1,461 acres and 97% of it was mature, comprising practically all of the merchantable timber in the logging chances. The yellow pine timber was 10,333 board feet per merchantable acre. Several interesting tables summarize the species composition and volumes encountered on the tracts. One table summarized the North Fork, Camp 3, and Whitney chances; it showed that the total number of stems per acre was 49, with 31 of those being yellow pine ranging from 4 to 32 inches DBH, with the remaining 18 stems being lodgepole pines in the 4-7" and 8-11" diameter classes. For the Tipton tract, the total stocking was 69 stems, with 25 being yellow pine (4-36 inches), 13 Douglas-fir (4-20"), 4 western larch (4-14"), 9 white fir (4-11"), and 18 lodgepole pine (4-11"). On the Tipton chance, about 5% of the trees were fire scarred, but on the other areas about 20% were so affected. Some evidence of insect killed trees and recent windthrow was also noted on the areas. The examiners noted that many areas had an open understory of lodgepole pine beneath the mature yellow pine overstory. The authors did not know if overgrazing, fires, or natural causes could be used to explain the lodgepole pine reproduction under a yellow pine overstory, although they believed that by protecting the area carefully after logging, the yellow pine would eventually prevail over the shorter-lived lodgepole. However, they recommended the situation be closely monitored since encroachment by lodgepole pine was noted as a prob-

lem in many localities. In the Tipton chance especially, they noted that every effort should be made to keep the area as a yellow pine forest by discouraging the advance growth of lodgepole pine. They recommended that slash be piled and burned following logging, except in the open stands near juniper barrens where lopping and scattering should be thoroughly tried since it should effectively conserve moisture for regenerating seedlings. The larch-Douglas-fir type was indefinite in these tracts since Douglas-fir grew most often with yellow pine and larch was commonly associated with lodgepole pine. It was observed that larch dwarf mistletoe seems to suppress and kill much of the western larch in the area and seldom were larch trees able to reach merchantable size. A stand table is provided for the fir-larch forest type. Pure lodgepole pine was minor, occurring mostly on moist sites in the Tipton area. It was notable that lodgepole pine was extending itself aggressively. Many small groups of dead lodgepole pines were observed, having been killed by insects *(Dendroctonus monticola)*. Juniper barrens (found on dry, rocky ridges), grass and sagebrush communities at lower elevations, three meadows (37 acres), and brushy river bottoms (54 acres) also occurred in the tracts. The report ends with a series of tables summarizing snags by section (within townships and ranges), areas and volumes by section, volume by logging chances and species, and types of logging chances.
Keywords: Blue Mountains/Forest inventory/Historical document/Insect damage/Larch dwarf mistletoe/Lodgepole pine/Mountain pine beetle/Ponderosa pine/Rocky Mountain Douglas-fir/Timber volume/Western juniper/Western larch/Whitman NF/Logging chances/North Fork Burnt River.

202. **Evans, R. M. 1912**. General silvical report: Wallowa and Minam Forests. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 54 p.
Notes: A digital version of this report is available; filename: Wallowa7. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report includes the following sections: list of coniferous trees; list of deciduous trees; list of shrubs; general description of topography and soil; fundamental forest types; general silvical description of vegetation zones (yellow pine, transition, alpine, and arctic-alpine or timberless zones); silvics of individual species; and silvical problems. A variety of silvical characteristics are described for each species (habit, occurrence, soil and moisture, shade tolerance, growth and longevity, reproduction, susceptibility to injury, etc.). The descriptions of the vegetation zones, including predominant forest types associated with each of them, are especially thorough. It provides interesting observations about plant succession, as illustrated with this quote: "There are patches of "scabland," characterized by very shallow soil, many rock fragments and a total absence of vegetation except in the spring months. It is interesting to note that some of these areas are being occupied by sagebrush where a few years ago, there was none. A possible explanation is that the annual fires of the Indians kept it killed out and now it has a chance to develop. Yellow pine is slowly encroaching upon the sagebrush, the chief factor in its rate of advance being moisture, provided fire is kept out. The same statement will hold true in regard to the other open areas as well. As fast as the reproduction has pushed out from under the protection of the parent trees, the periodical fires have killed it back, thus keeping the timber line practically stationary. In recent years, conditions have improved, and it is noticeable that the pine is reaching out, although slowly. The north slopes [are] being occupied by a thick stand of fir reproduction. Even pine is gaining a foothold here, and is gradually creeping across the ridge to the south slopes."
Keywords: Historical document/Wallowa NF/Minam NF/Wallowa-Whitman NF/Silvics/Blue Mountains/Whitebark pine/Ponderosa pine/Lodgepole pine/Western larch/Engelmann spruce/Mountain hemlock/Douglas-fir/Subalpine fir/Grand fir/Western juniper/Pacific yew/Willows/Quaking aspen/Black cottonwood/Water birch/Thinleaf alder/Red alder.

203. **Evenden, James C.; Bedard, W. D.; Struble, G. R. 1943**. The mountain pine beetle, an important enemy of western pines. Circular No. 664. Washington, DC: U.S. Department of Agriculture. 25 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular covers the following topics: importance of mountain pine beetle in forestry; description of the beetle itself; work and habits of the beetle, including host trees, recognition of attacks, methods of attack, types of infestation, spread of infestations, seasonal history; natural control of beetle populations; and direct control measures, including peeling, peeling and burning, decking and burning, burning standing trees, use of penetrating sprays, taking advantage of solar heat, mechanical protection, and cost and effectiveness of control.
Keywords: Mountain pine beetle/Insect control/Insects/Historical document.

204. **Farquhar, Henry H. 1912**. Western white pine seed collection, fall of 1911. Unpublished Typescript Report. [Missoula, MT]: [U.S. Department of Agriculture, Forest Service, Northern Region]. 40 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This interesting report describes a very large seed collection program that occurred in the fall of 1911 on

the Kaniksu National Forest in northern Idaho. Most of the collections occurred on the West Branch of the Priest River, due north of the towns of Priest River and Newport, Washington. The objective was to collect 20,000 bushels of western white pine, although no particular reason was given for a program of that size (perhaps due to increased planting and seeding needs following the extensive forest fires of 1910?). The report mentions that western white pine had an exceptionally large crop of cones in 1911, whereas other species had a correspondingly low cone crop that year. This meant that squirrel caching was confined almost exclusively to white pine and, since most collecting was from squirrel caches, this combination of circumstances was viewed as ideal for a large seed collection program. This report includes the following major sections: introduction; organization; the work; criticism; data; and costs. It includes detailed information on production rates, costs, labor forces, logistics, cone shipment forms, etc. A portion of a small-scale map of the Kaniksu (dated 1911) shows the actual areas from which cones were collected. Ten high-quality black-and-white photographs are included, several of which are 8" x 10" in size. Humorous accounts of camp life, Swedish laborers, union agitation among the pickers, competition between the pickers and squirrels for the cones (including squirrels robbing cones from sealed cone sacks), and other aspects of the project are provided in the report.
Keywords: Cone collection/Historical document/Northern Idaho/Seed collection/Kaniksu NF.

205. **Fernow, B. E. 1899**. Report upon the forestry investigations of the U.S. Department of Agriculture: 1877-1898. Document No. 181. Washington, DC: House of Representatives, 55th Congress. 329 p.
Notes: A photocopy of an original. Not all of the original was copied; pages 64-165 and 330-end were not copied due to the nature of their content.
Abstract: Due to Congressional concerns about the activities of the Forest Service, a rider was attached to the 1899 appropriations bill specifying that the Secretary of Agriculture make a special and detailed report about the forestry investigations and work of the Forest Service. This document is that report. The report includes the following topics: list of forestry publications issued by the Department of Agriculture since 1877; forests and forestry in the United States; forest policies of European nations; forest conditions and management in Germany, with a brief account of forestry in British India; principles of silviculture; principles of forest economy; forest influences; the work in timber physics in the Division of Forestry; and metal ties for railways.
Keywords: Historical document/Forest history/Forest inventory/Forest management/Silvics/Silviculture/European forestry/Forest policy/Economics.

206. **Fernow, B. E. 1891**. What is forestry? Bulletin No. 5. Washington, DC: U.S. Department of Agriculture, Forestry Division. 52 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: An early bulletin covering the following topics: the forest and its significance; objectives of forest management; reproduction; thinning; undergrowth; influences of light; administrative considerations; working plans; profitability of forest management; forest cover and moisture; how to plant trees; relation of tree growth to light; planting methods; tree culture on the western plains; and forest-tree culture in the Dakotas.
Keywords: Historical document/Thinning/Planting/Forest Management.

207. **Fernow, Bernhard E. 1911**. A brief history of forestry, in Europe, the United States and other countries. Toronto, Canada: University Press. 506 p. **Size**: 6" x 8".
Notes: An original copy. This is a revised and enlarged second edition of a work that originally appeared in 1907.
Abstract: This book covers the following topics: the forest of the ancients; Germany; Austria- Hungary; Switzerland; France; Russia and Finland; the Scandinavian States; the Mediterranean Peninsulas; Great Britain and her colonies; Japan; and the United States of America.
Keywords: European forestry/Forest history/Historical document.

208. **Fernow, Bernhard E. 1902**. Economics of forestry. New York, NY: Thomas Y. Crowell & Co. 520 p. **Size**: 5½" x 7½". **Notes**: An original copy.
Abstract: This is the second edition of a forestry textbook. It differs from other works of its time in that the primary focus of the book is not economics exclusively; many of the technical details of forestry are also included, particularly in relation to discussions about the economic feasibility of forestry practices of that era. These chapters are included: the relation of the state to natural resources; the forest as a resource; the forest as a condition; forest and forestry defined; factors of forest production and business aspects; natural history of the forest; methods of forest crop production: silviculture; methods of business conduct: forest economy; principles and methods of forest policy; forest policies of foreign nations; forest conditions of the United States; and the forestry movement in the United States. An appendix, bibliography and index is also included.
Keywords: Forest economics/Historical document.

209. **Fickes, Clyde P. 1945**. Building with logs. Miscellaneous Publication No. 579. Washington, DC: U.S. Department of Agriculture. 56 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in September, 1945.
Abstract: The art of log construction is relatively simple, once a few basic principles are understood. The pioneers who opened the lands beyond the eastern seaboard did not have boards with which to build such shelter as they needed. Logs were so plentiful in the forested area of our country that, with their resourceful ingenuity, the settlers built their homes in conformity with those principles of log construction which prevailed in the countries from which they migrated. Those principles have remained the same down through the years. Today, anyone working with log construction must know how to handle the double-bitted or single-bitted ax, the broadax, saw, adz, chisel, slick, ship auger, and drawknife. In this bulletin, it is assumed that the reader is also familiar with ordinary frame building methods used where wood is the primary construction material.
Keywords: Log construction/Historical document/Log structures.

210. **Fisher, George M. 1935**. Comparative germination of tree species on various kinds of surface-soil material in the western white pine type. Ecology. 16 (4): 606-611. **Notes**: A photocopy of an original.
Abstract: This article reports the results of a study designed to examine the germination requirements of nine forest species that occur in the western white pine of the northern Rocky Mountains. The results present the comparative germination of each species on a range of different soil materials and substrates. Eight different soil samples were obtained from typical forest sites near Priest River, Idaho. The eight samples included five different types of duff, as defined by the stand type from which it was collected, and bare mineral soil, ash, and rotten wood. This study involved a nursery experiment in which 500 seed were sown on the eight soil samples and then treated in a consistent manner from that point onward. The study found that germination percentages varied markedly by substrate type, for all species as a whole and by individual species. The germination percentages are reported by species for each of the eight substrates.
Keywords: Forest management/Grand fir/Historical document/Natural regeneration/Northern Idaho/Ponderosa pine/Priest River Experimental Forest/Rocky Mountain Douglas-fir/Seed germination/Western hemlock/Western larch/Western redcedar/Western white pine/Engelmann spruce/Lodgepole pine.

211. **Flint, Howard R. 1925**. Fire resistance of northern Rocky Mountain conifers. The Idaho Forester. 7: 7-10, 41-43. **Notes**: A photocopy of an original. The Idaho Forester was also referred to as “The University of Idaho Forest Club Annual”.
Abstract: This informative article discusses the fire resistance of major conifers found in the northern Rocky Mountains. The article was prepared during a time when silviculture was in its infancy in that region. It was hoped that whenever extensive silviculture occurred, it could exert a preference toward the fire resistant species. An analysis of fire resistance centered on the following seven characteristics: bark thickness, rooting habit, bark resin content, branching habit, stand growth habit, foliage flammability, and lichen growth. Although the author provides valuable insights based on his field experience, perhaps the most useful contribution from this paper was a table showing the relative fire resistance of 11 silviculturally important conifers of the northern Rockies. Those species are: western larch, ponderosa pine, Douglas-fir, grand fir, lodgepole pine, western white pine, western redcedar, Engelmann spruce, western hemlock, mountain hemlock, and subalpine fir.
Keywords: Douglas-fir/Engelmann spruce/Fire effects/Fire ecology/Grand fir/Hemlocks/Historical document/Lodgepole pine/Northern Rocky Mountains/Ponderosa pine/Rocky Mountain Douglas-fir/Subalpine fir/Western larch/Western redcedar/Western white pine.

212. **Flory, Charles H. 1910**. Organization of national forest force. Unpublished Typescript Paper. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 33 p.
Notes: A digital version of this report is available; filename: Flory1. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This long paper, which was delivered at the District 6 Supervisor’s Meeting on March 22, 1910, begins with a history of forestry in the world, including the history, administration, and organization of forestry programs in Germany and elsewhere in Europe. The author uses the historical context as a way to set the stage for his recommendations concerning the training and organization of the national forest work force. Two types of organization had been tried to that point on Pacific Northwest national forests: one involved dividing the forest into many small Districts, with each Ranger in the work force being assigned the administration of a particular District. If 10 Rangers are employed on the forest, then the forest would have 10 Districts. On other forests, the forest is divided into a set number of Districts, a senior Ranger is assigned to administer each of them, and one or more junior Rangers are assigned to each District to be “seasoned” by the more experienced Ranger in charge. Although no particular organizational scheme is endorsed, several alternatives are discussed.
Keywords: Historical document/Pacific Northwest Region/Forest organization/Forest staffing.

213. **Foster, H. D. 1906**. A forest assistant's camp on the reserve. Photo Number 61919. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 9 N., R. 42 E., Sec. 23. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is good; most of the foreground and background views are in sharp focus. The caption associated with this photograph was "A forest assistant's camp on the reserve. Since this camp is on land on which cattle grazing is allowed, it is necessary to enclose it with a fence to protect it. A wagon road leads to the camp, as is evidenced by the presence of the surrey on which all camp equipment and provisions were packed." This photograph also appeared in a 1994 reprint of George A. Bright's 1914 report describing an extensive reconnaissance of the Wenaha National Forest (see Bright 1914, and Bright and Powell 1994, in the history archives). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest. Camera settings: exposure 1/2"; stop of 128. Light: Clear. Hour: 10. Direction: W. Column number 50 H053. [Note: the camp is established in a dense stand that appears to be dominated by Engelmann spruce and subalpine fir. Dead trees (primarily subalpine fir) are evident in the photograph.].
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Forest types/Engelmann spruce/Subalpine fir/Spruce-fir forests.

214. **Foster, H. D. 1908**. Report on the silvics of the Blue Mountains (E) National Forest, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 30 p.
Notes: A digital version of this report is available; filename: Bluemtn2. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: Discusses the vegetation and general characteristics of the Blue Mountains (E) National Forest, much of which was later divided among the Whitman, Umatilla, and Malheur National Forests. Most of this report is based on a reconnaissance examination of an area near Sumpter, Oregon and as far west as Susanville. The following topics are described: topography (including geology), climate, economic aspects, and forest types (yellow pine, spruce, lodgepole pine, white fir, and mixed conifer types). The balance of the report provides descriptions for individual species, in which the general characteristics, site requirements, tolerance, reproduction, relationships with other species, and fire effects are discussed. The following species are described: yellow (ponderosa) pine, lodgepole pine, tamarack (western larch), Engelmann spruce, Douglas-fir, white (grand) fir, and other species (western white pine, juniper, etc.). Species rankings are provided in a section called "General Silvical Notes," where shade tolerance, demands upon soil and moisture, altitudinal range, and forest enemies are rated. The final page of the report is a list of the trees found on the Forest; 16 species are shown. This document includes some interesting insights about early forest conditions and management activities in the Blue Mountains, as illustrated with these quotes: "In all sales on this Forest, care should be exercised in marking the timber not to leave the cutting area in such condition that a valuable stand be supplanted by inferior species. White fir, though occasionally used for fuel when no better species are available, makes poor fuel wood, while for saw timber it is all but valueless owing to the fact that nearly all mature trees are badly rotted by a prevalent polyporus, and the wood season-checks badly. Unless care is taken this species is prone to supplant such species as yellow pine and tamarack since it is much more tolerant of shade in early life." "The forest floor is open, free from underbrush in any quantity, so much so that it is possible to ride in almost any direction through the forest without following trails." "Ten or twelve years ago a storm with the typical funnel-shaped cloud of a cyclone passed through Fox Valley, snapping large pine trees off eight or ten feed from the ground, uprooting others, and demolishing buildings in the town of Long Creek. It cut a swathe two miles wide through the forest. The storm was accompanied by hail-stones of irregular shape some of which measured 6¾ by 7¼ inches in circumference."
Keywords: Silvics/Blue Mountains/Blue Mountains NF/Whitman NF/Umatilla NF/Malheur NF/Forest types/Ponderosa pine/Lodgepole pine/Western larch/Engelmann spruce/Douglas-fir/White fir/Grand fir/Western white pine/Historical document.

215. **Foster, H. D. 1906**. Report on the silvics of the Wenaha Forest Reserve, Washington and Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 39 p.
Notes: A digital version of this report is available; filename: Wenaha4. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report includes the following sections: topography; climatic conditions of the region; general forest conditions; forest types (summit, flat, and canyon types); yellow pine; lodgepole pine; tamarack; Engelmann spruce; sugar pine-blue spruce; red fir; lowland white fir (grand fir); white fir; general silvical notes; and forest enemies. A wide variety of silvical characteristics are discussed for each of the species described. Foster provides some interesting insights about forest ecology, as illustrated with these quotes: "Forest types conform to the general topography of the country, each topographic type having a different class of forest which varies in the nature of the

species found on each, and in the condition of the timber and the forest floor. The forest types may be divided into the summit type, the flat, and the canyon." "Occasionally along the ridges in open spaces groups of aspen are found, and around springs alder grows. Along streams conttonwood and balm of Gilead is found with mountain maple, wild cherry, and other broadleaf species." "Reproduction after burns is usually very prolific, the principal species which come in as second growth being lodgepole pine and tamarack, with a lesser proportion of white fir, lowland fir, and the spruces. On unburned areas, reproduction is rather backward, especially in thick stands of timber, but in blanks reproduction often is rather abundant and of the same proportion as the surrounding forest." "The slopes are thin-soiled and usually not well watered. If it were not for the forest growth upon them, the soil should soon wash off, exposing the bare rock. This has happened where the bunch grass has been overgrazed by sheep, and there are no trees to hold the soil."
Keywords: Historical document/Wenaha NF/Silvics/Blue Mountains/Umatilla NF.

216. **Foster, H. D. 1906**. Rim rock on slope of Tucanon. Photo Number 61928. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Tucannon River. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. The caption for this photograph is "Rim-rock on slope of Tucanon. A characteristic feature of the canyon slopes near the edge of the reserve." Photo was taken about 2 miles east of Waterman's on the Tucanon. Camera settings: exposure 1/5" with a stop of 128. Light condition: clear. Hour: 4. Direction: N. Col. no: 50 To 92. Altitude: 3200'. West facing canyon slope. Soil: very little with basalt rock. This photograph also appeared in a 1994 reprint of George A. Bright's 1914 report describing an extensive reconnaissance of the Wenaha National Forest (see Bright 1914, and Bright and Powell 1994, in the history archives). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Rimrock/Tucannon River.

217. **Foster, H. D. 1906**. A sawmill operated under permit on the Wenaha Forest Reserve. Photo Number 61924. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. The caption associated with this photograph was "A sawmill operated under permit on the Wenaha Forest Reserve, showing log yard. Run by water power; circular saw; daily capacity 10,000 feet. Attached typescript caption located on front of photo states "An old sawmill near site of Tucannon Ranger Station – August 8, 1906. Operated by water power, using circular saw with daily capacity of 10,000 board feet." Camera settings: exposure 2.6 with a stop of 128. Light: diffused. Hour: 4 P.M. Direction: East. Col. no: 50 LW 166. This photograph also appeared in a 1994 reprint of George A. Bright's 1914 report describing an extensive reconnaissance of the Wenaha National Forest (see Bright 1914, and Bright and Powell 1994, in the history archives). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Tucannon River/Lumber production/Tucannon Ranger Station.

218. **Foster, H. D. 1906**. The Tucanon Creek looking down stream (north). Photo Number 61930. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 10, T. 9 N., R. 41 E., W. M. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. The caption associated with it states "The Tucanon Creek looking down stream (North). One of the perennial streams of the reserve. The river drops a little less than 100 feet to the mile. There is good water power to be had on this stream. 3 miles above a sawmill is run by its power, and a project is now "on" for the development of electric power and lighting for the cities below from its power. On its banks: Red Fir, Yellow Pine, White Fir, cottonwood, Balm of Gilead, Alder, Mountain Maple, etc." Camera settings: exposure .5 with a stop of 128. Light condition: clear. Time: 9. Direction: N. Altitude: 2400'. Slope: N. Rock: basalt and lava. Column number 50 Wa43. This photograph also appeared in a 1994 reprint of George A. Bright's 1914 report describing an extensive reconnaissance of the Wenaha National Forest (see Bright 1914, and Bright and Powell 1994, in the history archives).
Keywords: Columbia County WA/Tucanon Creek/Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/ Tucannon River.

219. **Foster, H. D. 1905**. Two silvics narratives for the Wenaha National Forest, Washington. Unpublished Typescript

Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 6 p.
Notes: A digital version of this report is available; filename: Wenaha3. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This accession consists of two miscellaneous silvical narratives: a 3-page document called "Reproduction," which was written in August of 1906 and includes a short discussion about planting; and a 3-page document called "The Forest," describing 5 blocks or divisions that the Forest was divided into for timber management purposes. "The Forest" document was prepared in 1905.
Keywords: Historical document/Wenaha NF/Silvics/Blue Mountains/Umatilla NF.

220. **Foster, H. D. 1906**. A typical farm on the Wenaha Forest Reserve. Photo Number 61932. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Sec. 10, T. 9 N., R. 41 E., W. M.]. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. The caption associated with this photograph was "A typical farm on the reserve. This farm (C. H. Waterman) is patented under the homestead laws. It lies in the bottomland of the Tucanon. This canyon bottom has agricultural land for some distance up, and is taken up in claims, as far up as the south line of Township 9 north. Charred stumps show the former presence of a Yellow Pine forest." Camera settings: exposure 128 with a stop of 2. Light condition: clear. Hour: 4. Direction: E. Altitude: 2400'. Soil: clay loam. Type: canyon bottom. Rock: basalt and lava. Col. no. 50 Ho 5A. This photograph also appeared in a 1994 reprint of George A. Bright's 1914 report describing an extensive reconnaissance of the Wenaha National Forest (see Bright 1914, and Bright and Powell 1994, in the history archives). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Agriculture/Tucannon River.

221. **Frank, Bernard**. **1955**. Our national forests. Norman, OK: University of Oklahoma Press. 238 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: This book covers the following topics: how it came about; profit, pleasure – and something more; within these borders; ten thousand loyal servants; questions for the future; and several appendixes. This book includes copious illustrations, most of which are black-and-white photographs.
Keywords: Forest history/Historical document/National forests/U.S. Forest Service history.

222. **Frothingham, E. H. 1909**. Douglas fir: a study of the Pacific Coast and Rocky Mountain forms. Circular 150. Washington, DC: U.S. Department of Agriculture, Forest Service. 38 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes early studies of Douglas-fir, including information about the differences between the coastal and Rocky Mountain forms. The following topics are discussed: historical perspective; distinguishing characteristics; silvical forms; geographical distribution; silvical regions within Douglas-fir's range; silvical characteristics of the two forms; and management practices.
Keywords: Douglas-fir/Rocky Mountain Douglas-fir/Silvics/Historical document.

223. **Furniss, R. L. 1947**. Memorandum regarding insect damage in the upper Umatilla River country. Unpublished Typescript Memoranda. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 5 p. **Notes**: An original copy.
Abstract: This document consists of three memoranda: an original memo from G. J. Tucker, District Ranger (Meacham District?), a transmittal memo from Glen Jorgensen in the Umatilla NF's Supervisor's Office in Pendleton, and a short reply memo from the Forest Insect Laboratory in Portland. While riding trails in the upper Umatilla River country in July of 1947, Ranger Tucker noticed severe conifer defoliation in several areas. He suspected that the damage was being caused by Douglas-fir tussock moth, and included a map with his memo that showed the general extent of the defoliated area. The reply from the Forest Insect Laboratory stated that the actual causal organism was western spruce budworm rather than tussock moth. At that time, spruce budworm was very active on the southern portion of the Umatilla National Forest. It appears that Tucker's memo may have been one of the first instances where budworm damage was noticed on the northern part of the Forest.
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Umatilla River.

224. **Furniss, R. L. 1945**. Memorandum regarding pine beetle hazard map for the Heppner Ranger District. Unpublished Typescript Memoranda. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 2 p. **Notes**: An original copy.
Abstract: This document consists of a single memorandum about a "pine beetle hazard map" that had been pre-

pared for the Heppner Ranger District. The map was based on field data collected in the fall of 1944. Hazard was shown on the map as four categories: low, moderate, high and very high. Those ratings were related to a percentage of high risk trees, as follows: low: 0-7 percent; moderate: 8-13 percent; high: 14-20 percent; and very high: 21 percent and over. Tree risk was based on Keen tree classes that related vigor and insect susceptibility to crown characteristics (primarily shape and density). [For information about the Keen classification system, see several items in the history archives, especially "Relative susceptibility of ponderosa pines to bark-beetle attack" from the Journal of Forestry (1936).] The hazard mapping was believed to reflect the areas that would suffer heavy beetle losses in the ensuing decade or so. Results of the mapping were as follows: low: 89,870 acres or 27.3%; moderate: 175,560 acres or 53.3%; high: 43,610 acres or 13.2% and very high: 20,460 acres or 6.2%. Three areas of very high hazard were centered in the following areas: Dixon, Wilson Prairie, and Deerhorn. Note: although this memorandum discusses a pine beetle hazard map, and summarizes results from it, a copy of the map itself is not in the history archives.
Keywords: Historical document/Insect damage/Umatilla NF/Bark beetles/Heppner RD/Insect susceptibility/Keen classification system/Western pine beetle/Mountain pine beetle/Wilson Prairie/Dixon Guard Station/Deerhorn Creek.

225. **Furniss, R. L.; Buckhorn, W. J.; Wright, K. H. 1948**. The spruce budworm in Oregon and Washington; season of 1948. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Insect Laboratory. 19 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is a report about the status of a widespread spruce budworm outbreak in the Douglas-fir and balsam (grand) fir stands of Oregon and Washington. The purpose of this report was to record what is known about the budworm outbreak and to discuss the control possibilities. The data presented were based on five years of observations, intensive surveys in 1947 and 1948, and an experimental control project and detailed biological studies in 1948. Maps and tables are included that show the extent and intensity of the infestation. The possibilities for control are also discussed. The report includes the following sections: introduction; the budworm and its habits; the current outbreak (history, survey of 1948, situation in the Blue Mountains, situation in the Oregon Cascades, and situation in other areas); control considerations; and recommendations. Two tables (intensity of infestation; ownership of infested areas) and two maps (Blue Mountains area; Oregon Cascades area) are present at the end of the report, although map 1, Blue Mountains area, was the only one copied since both maps were in color and oversized. This report builds on work initiated in 1947 (see an item in the history archives called "Defoliator situation in the fir stands of eastern Oregon and Washington" by W. J. Buckhorn for detailed information about the 1947 situation) when it was proposed to conduct a large-scale control experiment on the Heppner Ranger District of the Umatilla National Forest. That experiment was completed in late June and early July of 1948 when it was demonstrated that aerial application of one pound of DDT in one gallon of fuel oil per acre, when properly timed, provided control at levels ranging up to 95 percent. An intensive study of the budworm was made throughout the 1948 season on the Heppner Ranger District and other representative areas in the Blue Mountains. The habits of the budworm were studied and records were kept on the degree of parasitism and the incidence of disease. During August and September of 1948, an intensive survey of budworm defoliation was made by aerial and ground methods; the results of that survey are given area by area (the results are generally summarized by national forest) in this report. As of this report, the budworm outbreak in the Blue Mountains was the most extensive in the region, comprising some 1,243,000 acres. Defoliation was rated as very high on 203,000 acres, and high on 256,300 additional acres. For the Umatilla NF, the total budworm infestation increased more than 100% from 1947 (374,000 acres) to 1948 (807,000 acres). Heavy and very heavy defoliation on the Umatilla NF comprised 392,000 acres of the total. The heavy and very heavy defoliation had weakened trees to the point that outbreaks of Douglas-fir beetle and other bark beetles were expected. The author concludes by noting that control of the spruce budworm was not a simple matter. It was difficult to know when, or if, control was necessary. He also recognized that one treatment may not be enough since the budworm often had a long infestation cycle, especially as compared to Douglas-fir tussock moth. The possibility that repeated treatments may be necessary was one reason that protected stands had to be of sufficient value to warrant the cost of more than one treatment.
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/DDT/Insect control/Heppner RD.

226. **Gabrielson, Ira N.; Horn, E. E. 1930**. Porcupine control in the western states. Leaflet No. 60. Washington, DC: U.S. Department of Agriculture. 8 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Includes the following topics as related to porcupine control: description and habits, food habits, and movements and migrations of porcupines; control by hunting and shooting; control by poisoning; and the use of tree stations.
Keywords: Porcupines/Animal damage control/Historical document.

227. **Gannett, Henry**. **1888**. Do forests influence rainfall? Science. 11 (257): 3-5.
Notes: A photocopy of the original article published on January 6, 1888.
Abstract: This article was written during an era of lively debate about the influence of forests, and vegetation in general, on the climate of an area. The author used rainfall records from three areas of the United States to test the hypothesis that "the culture of forests induces an increase in rainfall, and that their destruction diminishes it." He used the Midwest because it represented an area of over 100,000 square miles that was mainly grass covered when settlement began, but has experienced reforestation on "an immense scale" following settlement. He examined conditions in Ohio because almost 40,000 square miles of indigenous forest was cleared during settlement. And, finally, he used the New England region because most of it was cleared during settlement, but approximately half of the cleared area had since reforested. His results found that rainfall did not appear to have increased in the Midwest (based on analysis of 24 precipitation stations), that rainfall was unaffected in Ohio even with the clearing of forest (based on analysis of 12 precipitation stations), and that deforestation in southern New England appeared to have resulted in an increase in rainfall (based on analysis of 18 precipitation stations). [Note: Henry Gannett was an American cartographer born in Bath, Maine. He was a topographer for the Hayden Survey between 1872 and 1879, preparing maps in Colorado and Wyoming. He was appointed Chief Geographer of the Geological Survey in 1882. He was also one of the founders and later a president of the National Geographic Society.]
Keywords: Forest influences/Historical document/Climate/Precipitation.

228. **Gannett, Henry**. **1902**. The forests of Oregon. Professional Paper No. 4, Series H, Forestry, 1. Washington, DC: U.S. Department of the Interior, Geological Survey. 36 p. **Notes**: A photocopy of an original.
Abstract: This early publication provides a cursory description of the forest resources of Oregon at the turn of the twentieth century. Since the Forest Service had not yet been created, this work was prepared by the Geological Survey because the Department of Interior had been given responsibility for management of the Forest Reserves. The following topics are discussed: classification of lands; fires; stand of timber; species of timber; and classification of lands and stand of timber, by counties. Each county description included a short narrative description, the area of certain land classifications (total, merchantable timber, cut area, open country, etc.), and the volume, in million board feet, for individual species. This paper includes excellent photographs and a full-color map, in a back pocket, that shows forested areas classified using volume per acre (see Thompson and Gilbert 1900 for detailed information about the map), and the location of harvested areas and major forest fires. It also includes interesting observations about early forest conditions, such as this: "the burns are greatest and most frequent in the most moist and most heavily timbered parts of the State, and are smaller and fewer where the rainfall is less and where the timber is lighter. This is owing to the density and abundance of the undergrowth in the heavily forested regions, which feeds the fire and vastly increases its heat. In the comparatively sparsely timbered southern portions of the Coast Range and the Cascades and in the Blue Mountains, where the forests are largely or mainly of yellow pine in open growth, with very little litter or underbrush, destructive fires have been few and small, although throughout these regions there are few trees which are not marked by fire, without, however, doing them any serious damage." The full-color map was photographically copied, and copies are hanging at several locations in the Supervisor's Office. The map was also digitized for the Forest's geographic information system (northeast Oregon portion only). [Note: Henry Gannett was an American cartographer born in Bath, Maine. He was a topographer for the Hayden Survey between 1872 and 1879, preparing maps in Colorado and Wyoming. He was appointed Chief Geographer of the Geological Survey in 1882. He was also one of the founders and later a president of the National Geographic Society.]
Keywords: Oregon/Forest mapping/Forest inventory/Forest fires/Timber harvesting/Historical document.

229. **Gannett, Henry**. **1902**. The forests of Washington: a revision of estimates. Professional Paper No. 5, Series H, Forestry, 2. Washington, DC: U.S. Department of the Interior, Geological Survey. 38 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This early publication provides a cursory description of the forest resources of Washington at the turn of the twentieth century. Since the Forest Service had not yet been created, this work was prepared by the Geological Survey, who had been given responsibility for management of the Forest Reserves. The following topics are discussed: classification of lands; fires; stand of timber; species of timber; and classification of lands and stand of timber, by counties. Each county description included a short narrative description, the area of certain land classifications (total, merchantable timber, cut area, open country, etc.), and the volume, in million board feet, for individual species. This paper includes excellent photographs and a full-color map, in a back pocket, that shows forested areas classified using volume per acre, and the location of harvested areas and major forest fires. The included map was digitized for the Forest's geographic information system (southeast Washington portion only). [Note: Henry Gannett was an American cartographer born in Bath, Maine. He was a topographer for the Hayden Survey between 1872 and 1879, preparing maps in Colorado and Wyoming. He was appointed Chief Geographer of the Geological

Survey in 1882. He was also one of the founders and later a president of the National Geographic Society.]
Keywords: Washington/Forest inventory/Forest fires/Timber harvesting/Historical document.

230. **Gannett, Henry**. **1888**. The influence of forests on the quality and frequency of rainfall. Science. 12 (303): 242-244. **Notes**: A photocopy of the original article published on November 23, 1888.
Abstract: This article was written during an era of lively debate about the influence of forests, and vegetation in general, on the climate of an area. The first portion of the article is a summary of points made by Professor Fernow from the Department of Agriculture at a meeting of the Philosophical Society of Washington. The balance of the article is the remarks made in a subsequent presentation at the same meeting by Henry Gannett. Gannett's comments can be considered as a follow-up to the article he wrote earlier in the year (see Gannett 1888 for more info). Fernow describes a very extensive study of forest/ precipitation influences conducted in Europe (Bohemia) that involved the use of 700 ombrometric stations. That study found that forests apparently do influence rainfall, since the 48 stations with the greatest deviation from the mean occurred in heavily forested areas. Gannett restates many of the conclusions from his earlier paper in Science, and maintains that no cause-effect relationship can be proved for forests and climate. He concludes by stating "is it worth while to go planting trees for their climatic effects? It seems to me, that, apart from the usefulness of it, nature is planting trees at an infinitely more rapid rate than man. For every tree planted under the timber-culture act, or on Arbor Day, a thousand spring up of their own accord. Every deserted farm east of the plains grows up to forest. Half of southern New England is to-day wooded, and the proportion is increasing every year, and yet in Massachusetts they have every year an Arbor Day, when the farmers turn out and solemnly plant a tree apiece." [Note: Henry Gannett was an American cartographer born in Bath, Maine. He was a topographer for the Hayden Survey between 1872 and 1879, preparing maps in Colorado and Wyoming. He was appointed Chief Geographer of the Geological Survey in 1882. He was also one of the founders and later a president of the National Geographic Society.]
Keywords: Historical document/Forest influences/Climate/Precipitation.

231. **Gardner, W. J. 1905**. Results of a Rocky Mountain forest fire studied fifty years after its occurrence. Proceedings of the Society of American Foresters. 1: 102-109. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article provides remarks delivered by Gardner before the Society of American Foresters on April 28, 1904. It describes the results of an examination of forest burns on the southern portion of the Pikes Peak Forest Reserve along south-central Colorado's Front Range. The examinations, which were conducted by the Bureau of Forestry, had two main objectives: to determine the natural reforestation rates on this important watershed for the city of Colorado Springs, and to determine if tree planting was advisable to supplement the natural regeneration. The examined area consisted of 79 square miles lying south of the Cog Railroad (which reaches the 14,147-foot summit) and as far as the Peak itself. Over 56% of the examined area lies above 9,000 feet in elevation. Gardner recognized four basic forest zones: the Engelmann spruce type; the limber pine type; the red (Douglas-) fir type; and the bull (ponderosa) pine type. The Pikes Peak reserve had been well timbered until a very destructive fire, or series of fires, swept the region and destroyed about 75% of the forest cover. At the time of the examination, about one-third of the area below upper timberline had patches of virgin timber or fully-stocked stands of young growth; the remaining two-thirds was absolutely barren of living tree growth or supported very scanty conifer reproduction. The examiners used fire-scar counts, ring counts from young trees, and a lack of written or spoken testimony about recent large fires as the basis for setting the date of the large, destructive fire as approximately 50 years before their examination (i.e., in the late 1840s or early 1850s). This date seemed to coincide with evidence regarding other large fires during the middle of the 19th century; for example, evidence of a very large fire in northern New Mexico had been found during the summer previous to their examinations. At lower elevations of the great burn, the large quantities of dead wood had been removed during the settlement era; at higher elevations and at greater distances away from well-traveled roads, prolific quantities of dead wood remained, both standing and down. Much of that wood was still perfectly sound even after 50 years, and it looked as if the dead bristlecone pine at very high elevations would never decay. Based on their examinations and measurements, the author did not believe that any more than 10 percent of the 1850 burn had fully restocked with forest trees. Quaking aspen was very abundant in burns in the southern third of the examined district. Although ecologists considered aspen to be a "nurse tree" for the conifers, Gardner did not agree with that assessment because he seldom found instances where a burn was succeeded first by aspen growth and then subsequently by conifers. When age counts were made in mixed stands, aspen was found to have started at the same time as the conifers or even later. Gardner believed that aspen did not impede conifer regeneration, and that it served a very valuable function as a soil protector for the coarse-textured, decomposed granite soils of the region. Aspen stands along the southern border of the reserve had just sustained a major tent caterpillar outbreak; the many dead aspen trees littering the ground had increased the fire danger for that area. Gardner noted that of the conifer species, Engelmann spruce came in most quickly after the fire, followed by Douglas-fir and then the pines. Most of the spruce regeneration started within 10 years of the great burn; surprisingly, lit-

tle or no conifer reproduction had gotten established within the 30 years just prior to the examination. The spruce was extremely slow growing; trees 2 to 4 feet tall were commonly 40 to 45 years old, although they measured one spruce tree that was 45 feet tall and 45 years of age. Gardner also found several very old pole-sized stands where spruce trees 6 to 7 inches in diameter were 250 to 270 years old, a remarkable testament to the impressive shade tolerance of that species.
Keywords: Central Rocky Mountains/Fire ecology/Fire effects/Forest ecology/Forest fires/Historical document/ Natural regeneration/Plant succession/Quaking aspen/Limber pine/Pikes Peak/Bristlecone pine/Engelmann spruce/ Rocky Mountain Douglas-fir/Front Range CO.

232. **Gaskill, A. 1903**. Blue Mountains Reserve. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Bureau of Forestry]. 8 p.
Notes: A digital version of this report is available; filename: Bluemtn6. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This early report provides a brief description of the area being considered for a Blue Mountains Forest Reserve. A short discussion of the forest vegetation in each township is included. No introductory remarks or overall descriptions (topography, soils, etc.) are provided, even though that was typical for other reports of the same era by this particular author.
Keywords: Historical document/Blue Mountains Forest Reserve/Blue Mountains.

233. **Gaskill, A. [1903]**. La Grande Forest Reserve. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Bureau of Forestry]. 8 p.
Notes: A digital version of this report is available; filename: Lagrande1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report discusses the following topics as related to the proposed La Grande Forest Reserve, which was located in extreme northeastern Oregon and a small portion of southeastern Washington: location; topography; water; soil; forests; and culture. Very short descriptions of the vegetation are provided for each of the 17 townships that were contained in the area being examined.
Keywords: Historical document/La Grande Forest Reserve/Blue Mountains/Wenaha NF/Umatilla NF/Wallowa-Whitman NF.

234. **Gaskill, A. 1903**. Wallowa Reserve. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Bureau of Forestry]. 7 p.
Notes: A digital version of this report is available; filename: Wallowa3. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report includes the following sections: location; topography; water; soil; forest; culture; and the Wallowa Reserve (general description of vegetation for groups of townships).
Keywords: Historical document/Wallowa Forest Reserve/Wallowa-Whitman NF/Forest management/Blue Mountains.

235. **Gedney, Donald R. 1963**. Toward complete use of eastern Oregon's forest resources. Resource Bulletin PNW-3. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 71 p. **Notes**: An original copy.
Abstract: During the decade of the 1950s, a reinventory of the forests of eastern Oregon was completed. The 1950s inventory, after being adjusted to January 1, 1963, along with several supplementary studies of the forest industries, provides the foundation for this report. The standing timber volume for eastern Oregon was estimated to be 125 billion board feet as of January 1, 1963, as compared to an estimate of 96 billion board feet in 1936. This report discusses the following topics: forests and the economy of eastern Oregon; achieving growth of forest industries in eastern Oregon; and balancing today's needs with tomorrow's needs. An extensive appendix is also included. This report includes interesting insights about successional trends, as illustrated with this quote: "If present trends continue, the proportion of ponderosa pine will be less in the future than at present. In 29 percent of all the pine sawtimber types, there is no understory of pine, only other species – Douglas-fir, white fir, and lodgepole pine. In another 27 percent of the pine sawtimber stands, the understory is a mixture of young ponderosa pine and other species. On more than half of this area, species other than pine predominate. Unless something happens to change this relationship, or unless more intensive forest management is undertaken, about 40 percent of the pine sawtimber type is likely to shift to some other type."
Keywords: Eastern Oregon/Forest inventory/Community development/Historical document.

236. **Gedney, Donald R.; Mayer, Carl E. 1956**. Forest statistics for Hood River County, Oregon. Forest Survey Report

No. 125. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 28 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1954, of Hood River County, which was initially inventoried in 1932. The following topics were discussed: foreward; significant findings in the forest inventory (general, land classification, commercial forest land area, commercial forest land timber volumes, forest ownership, forest utilization); forest survey procedure; accuracy of 1954 reinventory data; differences in results of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (uncut sawtimber, selectively cut sawtimber, young-growth, nonstocked burns and cutover, noncommercial forest, nonforest). Thirteen tables of statistics are included.
Keywords: Forest inventory/Historical document/Mt. Hood NF/Hood River/Hood River County OR.

237. **Gedney, Donald R.; Ray, Walter H. 1955**. Forest statistics for Morrow County, Oregon. Forest Survey Report No. 120. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 25 p. **Notes**: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1954, of Morrow County, which was initially inventoried in 1936. The following topics were discussed: significant findings of the forest inventory (land classification, timber volume, forest ownership, forest utilization); forest survey procedure; accuracy of reinventory data; difference in results of inventories (1936 to 1954); and definition of terms. A map shows the location and distribution of forest stand-size and condition classes in the county. Twelve tables of statistics are included.
Keywords: Forest inventory/Morrow County OR/Eastern Oregon/Umatilla NF/Historical document.

238. **George, Gordon W. 1976**. Western forest insect issues study. Unpublished Typescript Memorandum. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 15 p. **Notes**: An original copy.
Abstract: This accession consists of a one-page transmittal memorandum from the Umatilla National Forest's Timber Staff to the Regional Forester of Region 6; five forms entitled "Western forest insect damage survey;" 4 hand-written pages summarizing Douglas-fir tussock moth timber salvage sales (volumes by species and sale); and the same 5 forms mentioned before, but completed in pencil rather than black ink. The forms summarize information by state, national forest, forest type, and pest group. Two forms are provided for defoliators in the Douglas-fir type (one each for Oregon and Washington), two for defoliators in the fir-spruce type; and one for bark beetles in the lodgepole pine type. The only information recorded on the forms are the acres (in thousands) and sawtimber volumes associated with salvage sales occurring in the forest type and pest group referenced on the top of the form.
Keywords: Blue Mountains/Historical document/Insect control/Insect damage/Timber salvage/Umatilla NF/ Mountain pine beetle/Douglas-fir tussock moth.

239. **Giertson, Joe**. **1985**. It wasn't easy controlling the budworm in the fifties. Timberlines. 26 (August): 22-23.
Notes: A photocopy of an original.
Abstract: This article describes several budworm spray projects completed during the 1944-1958 budworm outbreak in the Blue Mountains. It begins with an account of the Meacham project in 1953, when a temporary runway was constructed on a scab flat near the townsite of Meacham. He also describes the Fox project on Long Creek Ranger District in 1954, and a large, million-acre project in 1958 on both the Malheur and Whitman NFs. DDT was used as the chemical insecticide for all of these projects.
Keywords: DDT/Insect control/Malheur NF/Northeastern Oregon/Umatilla NF/Western spruce budworm/Whitman NF.

240. **Gifford, John**. **1906**. Practical forestry. New York, NY: D. Appleton and Company. 284 p. **Size**: 5" x 8".
Notes: An original copy.
Abstract: This early book includes the following chapters: meaning of forest and forestry; woodlots on farms and forest estates; the forest canopy, forest floor, and woodmass; the forest as an agent in modifying the surface of the earth and in checking the destructive forces of nature; the geographical distribution of forests; the formation of forests; the tending of forests; forest industries and products; forest trees and products of the tropics; the principal federal and state reservations; and a list of fifty American forest trees.
Keywords: Historical document/Forest management/Forest history/International forestry/Forest ecology.

241. **Gilkey, Harold P. 1912**. Study of western larch. Annual Silvical Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 18 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes the ecology of western larch on the Whitman National Forest. The report begins with the following quote: "western larch is not in its optimum range in the Whitman National Forest. This is due to a lack of moisture. According to Sudworth this tree demands an annual rainfall of from 20 to 30 inches, coming very largely in the winter and spring. In this Forest the rainfall is on an average 20.7 inches. This is sufficient to permit larch to grow, but not enough to produce a vigorous and thrifty tree. As a result of insufficient moisture it is of slow growth and often dies early." The author believed that the forested area of the Whiman NF could be divided into three types, based on soil moisture availability: the yellow pine slope type; the north slope type; and the transition type. The yellow pine slope type was characterized by a high proportion of yellow (ponderosa) pine in the stand (75-100%). These areas typically occurred on dryer south and west facing slopes up to 7,000 feet elevation, and on dry benches. Although it was comprised chiefly of yellow pine, the yellow pine slope type also contained small amounts of western larch, Douglas-fir, white fir, and lodgepole pine. The north slope type was found on north- and east-facing slopes where soil moisture was relatively abundant. Although comprised of the same species as the yellow pine slope type, the predominant ones were white fir, Douglas-fir, and western larch, with minor amounts of yellow pine and lodgepole pine. The transition type occurred on moist sites and at high elevations, where yellow pine did not grow. The subalpine form of the transition type occurred at elevations above 6,500 feet and was typically dominated by stands of lodgepole pine. Western larch grew best on well-drained bottom lands where the roots had access to abundant moisture, but it did not grow well on saturated sites with an excessive amount of soil moisture. Gilkey ranked the moisture requirements of the five most common tree species as follows: yellow pine (lowest), Douglas-fir, western larch, lodgepole pine, and white fir (highest). Larch was considered to be the most shade intolerant species on the Forest, with the trees ranked in this order: white fir (most tolerant), Douglas-fir, lodgepole pine, yellow pine, and western larch (least tolerant). The author noted that dwarf mistletoe was abundant throughout the larch type, with saplings frequently infected by the time that they were an inch or less in diameter. It was noted that mistletoe infections varied for the various physiognomic types: 79% of the larch was found to be infected in mixed stands on the dry (yellow pine) slope type, while only 27% of the larch was infected on the moister north slope and transition sites. Larch was observed to start producing good quantities of seed by the time it had reached a diameter of six inches or more (generally about 60 years of age). It was also noted that larch often formed pure stands, especially after wildfire, but that pure stands seldom persisted past the pole size class. At that point in its development, snow often bends the slender trees over and breaks many of them off, thereby thinning the stand and allowing the shade tolerant firs to come in underneath and persist to maturity. In terms of ecomonic value, the larch was considered to rank third behind yellow pine (which brought $2.97 per thousand board feet back then) and Douglas-fir ($1.14 per thousand board feet). Although larch returned the same stumpage price as Douglas-fir, it was considered less valuable due to its greater defect (shake, etc.) and its generally smaller size. The original report included 5 high-quality black-and-white photographs.
Keywords: Blue Mountains/Forest ecology/Forest management/Historical document/Larch dwarf mistletoe/ Silvics/Western larch/Whitman NF.

242. **Gisborne, H. T. 1936**. Measuring fire weather and forest flammability. Circular No. 398. Washington, DC: U.S. Department of Agriculture. 58 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in July, 1936.
Abstract: This circular summarizes the information available on accepted methods of measuring fire weather and forest flammability. It was prepared for the northern Rocky Mountains, but the principles were applicable elsewhere. The sole purpose of the measurements and techniques described in this bulletin is to improve forest fire control. The following topics are discussed: introduction; factors measured and observed – instruments and methods; weather; fuel moisture; other factors proposed for observation and measurement; integration of measurements; record-keeping methods; use of records (localizing weather forecasts, estimating current danger, making fire-danger comparisons); literature cited; and appendix.
Keywords: Fire weather/Forest flammability/Forest fires/Historical document/Fire control.

243. **Gleason, H. A. 1927**. Further views on the succession concept. Ecology. 8 (3): 299-326.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: The purpose of this paper was to show the difficulties and inaccuracies arising from an overly strict application of the succession concept. The author considers plant succession to be an extraordinarily mobile phenomenon whose precepts cannot be stated as fixed laws, but only as general principles of an exceedingly broad nature and not always in a definitely predictable way. The following topics are discussed: evidence for succession; interaction of successional causes; difficulties in determining past and future successions; retrogressive successions; general significance of successional phenomena; definitions of the succession concept; does the succession concept in-

clude every sort of vegetational change?; tension zones and tension periods; significance of the climax; successional series; correlation of time phases and space phases; succession depends on the behavior of the individual plant; relation between the association concept and the succession concept; and conclusions.
Keywords: Forest ecology/Historical document/Plant succession.

244. **Gleason, H. A. 1939**. The individualistic concept of the plant association. The American Midland Naturalist. 21: 92-110. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: The author describes the history of the plant association as a concept. He discusses the three primary theories of the plant association concept as they existed at that time: the association is an organism or quasi-organism; the association is not an organism but a series of separate but similar vegetation units; or the association is a temporary and fluctuating vegetation unit with little or no similarity to an organism. Several basic tenets of plant distribution are discussed, including "every species of plant has reproductive powers in excess of its need; every species of plant has some method of migration; the environment in any particular station is variable; and the development of a vegetational unit depends on one or the other of two conditions, the appearance of new ground or the disappearance of an existing association." Gleason comes to the following conclusions: environment varies continuously in time and space; a plant association is more than an abstract concept because it has dimensions, area, and is a tangible entity that can be mapped, photographed and analyzed; every association occupies a discrete position in the two dimensions of environmental variation (time and space); and vegetational units that maintain a reasonable degree of homogeneity over appreciable amounts of environmental space and time can be considered to represent plant associations.
Keywords: Forest ecology/Historical document/Plant succession/Vegetation classification/Plant associations.

245. **Granger, C. M. 1926**. Estimated stand of timber. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 3 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This memorandum, dated February 2, 1926, is referenced S-Plans, Timber Surveys, and addressed to the Forester in Washington, DC. It is a reply to a memorandum from the Forester that was dated January 14 and included an enclosure. This memorandum corrects some of the information that was included on the Forester's enclosure, which dealt with the estimated stand of timber (total timber volume) on the Forests of District (Region) 6. The memo includes new standing volume figures for seven forests in the District, two of which were in the Blue Mountains: the Malheur NF (9,665,797 MBF) and the Whitman NF (5,691,954 MBF). There is also a table on page 2 that provides an estimate of the total standing volume, by tree species, for the District as a whole. The top three in that table were Douglas-fir (102,960,272 MBF), western yellow pine (34,247,377 MBF) and western hemlock (28,297,461). Lodgepole pine, white fir, and western larch were each shown as not quite 5,000,000 MBF.
Keywords: Historical document/Malheur NF/Timber volume/Whitman NF.

246. **Granger, C. M. 1926**. Memorandum regarding timber surveys in District 6. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 7 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession, which is dated January 15, 1926, consists of a 6-page memorandum and a single-page map. It is addressed to the Forester (Chief) and pertains to timber surveys in District (Region) 6 of the Forest Service. It responds to a series of questions contained in a letter from the Forester dated November 24, 1925. Unfortunately, the original letter was not contained in the folder and the questions were not restated before each reply, so the reader is not always sure what question is being answered by the information being provided. However, it is obvious that the original questions dealt mostly with timber surveys – either areas that had already been surveyed, or areas that would need to be surveyed because timber sale applications had recently been received or were anticipated in the near future. In terms of the Blue Mountain national forests, some of the project areas mentioned in this memo include: Logan Valley-Crane Prairie (Malheur NF); Grande Ronde (Umatilla and Whitman NFs); and Emigrant-Silver Creek (Ochoco and Malheur NFs). The map included with this accession is a ¼-inch to the mile map of the Hilgard Project on the Umatilla NF. It shows 2 general timber survey areas – one centered on Spring Mountain-Sugarloaf Mountain, and the other at Dark Canyon/Little Dark Canyon and Ensign Creek.
Keywords: Forest inventory/Historical document/Umatilla NF/Pacific Northwest Region/Timber surveys/Malheur NF/Ochoco NF/Whitman NF.

247. **Graves, Henry S. 1911**. Principles of handling woodlands. New York, NY: John Wiley & Sons. 325 p. **Size**: 6" x 8". **Notes**: An original copy.
Abstract: This classic early work includes the following chapters: introduction; the selection system; systems of clear-cutting; the shelterwood system; the coppice systems; improvement of the forest; protection of forests from

fire; and protection from other injurious agencies. This book includes many illustrations, most of which are black-and-white photographs.
Keywords: Historical document/Forest policy/Silvicultural systems/Selection cutting/Clearcutting/Shelterwood cutting/Coppice cutting/Improvement cuttings.

248. **Graves, Henry S. 1910**. Protection of forests from fire. Bulletin No. 82. Washington, DC: U.S. Department of Agriculture, Forest Service. 48 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: The author advocates development of a strong fire control program for the forests of the United States. The following topics are discussed: characteristics of surface fires, ground fires, and crown fires; damage caused by fires, including injury and death of trees and damage to soils; importance of fire prevention, including eliminating fire causes and emphasis on careful slash disposal; development of fire lines; fire supervision and patrol; and fire fighting methods, including adequate forces and their organization, proper equipment, fire fighting methods based on fire intensity, back firing techniques, and mop-up or post-fire patrols.
Keywords: Fire control/Fire fighting/Forest history/Historical document.

249. **Graves, Henry Solon**. **1907**. Forest mensuration. New York, NY: John Wiley & Sons. 458 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: This early textbook includes the following chapters: introduction; the determination of the contents of logs in board measure; detailed discussion of log rules; log rules based on standards; methods of scaling logs; determination of the contents of logs in cubic feet; determination of the cubic contents of squared logs; cord measure; the contents of entire felled trees; determination of the height of standing trees; determination of the contents of standing trees; volume tables; form factors; determination of the contents of stands; determination of the age of trees and stands; the growth of trees and stands; yield tables; and graphic methods used in forest mensuration.
Keywords: Historical document/Forest inventory/Forest measurements/Volume tables/Timber measurements.

250. **Greeley, W. B. 1912**. Cost of reconnaissance work in mountainous country in the northwest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 2 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short report is an extract from a letter of May 11, 1912 to Appleton and Sewall Company and signed by W. B. Greeley. It is unknown what the Appleton and Sewall Company was, but it seems they were interested in obtaining cost data for reconnaissance work that would be applicable to British Columbia, Canada. Greeley states that during fiscal year 1910, 49,588 acres were cruised and mapped on the national forests in Oregon and Washington at an average cost of 9 cents per acre. During fiscal year 1911, 197,498 acres were cruised and mapped at an average cost of 8.3 cents per acre. Individual project costs ranged from 5.3 cents to 12 cents per acre, depending mostly upon the scale and organization of the work, and the density of the timber. The lower costs were generally associated with the comparatively open yellow pine stands growing east of the Cascade Mountains. The Oregon/Washington costs were comparable to those obtained elsewhere. In northern Idaho, reconnaissance mapping in heavy stands of white pine, larch and Douglas-fir ranged from 5 to 8 cents per acre. In lodgepole pine stands along the main crest of the Rocky Mountains in central Montana, a great deal of reconnaissance was completed for 3 to 4½ cents per acre. Reconnaissance work consisted of: reestablishment and marking of section corners and section lines in country that had been surveyed; running of major and secondary base lines along the major streams in unsurveyed territory; preparation of a topographic map at a scale of 4 inches to the mile (100-foot contour interval), along with supplemental type mapping showing forest composition, age, density, and condition; estimates of merchantable timber by species as based on an actual tally (cruise) of five percent of the forested area; and preparation of notes on the condition of the forest, age, maturity, areas of land that were adapted to agriculture, areas requiring forest planting, and all areas of reproduction and immature growth (mapped and classified by age, density, and composition).
Keywords: Forest inventory/Forest mapping/Historical document/Land classification/Pacific Northwest.

251. **Greeley, W. B. 1925**. Fire damage appraisal. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 16 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a 6-page memorandum from the Forester (Chief) of the Forest Service to the District (Regional) Foresters about damage appraisal for forest fires, and a 10-page appendix that describes how to complete a fire damage appraisal. The appendix is entitled "Instructions for Cruising Fire Damage." Greeley begins the memo by observing that "the importance of the fire-control job on the National Forests has been so great, and its prosecution so absorbing, that I think we have drifted into a habit of carelessness in the determination of our fire losses. Each year we assemble and use for various purposes estimates of damage, but with the knowledge that

in most cases they are very rough approximations indeed." The information in the memorandum and its accompanying appendix were prepared as a result of the Mather Field Conference in 1921, at which time a committee was appointed to work on the fire damage appraisal problem. One change that this memo and its appendix implemented was to establish regional values, based on forest type and site, that would account for degree of stocking, future yield, rotation age, age of young growth, and stumpage rates for use with fire damage appraisals. Previously, those values were determined on a case by case basis. Formulae are presented that were used to derive many of the values contained in the appendix. When a burned area was not expected to regenerate naturally, then it was appropriate to include a planting allowance in the fire damage appraisal and the planting rate used was $5 per acre. The appendix includes the following sections: time after burn; cruising methods; layout of strips; mapping of types; mapping of areas; mapping of site quality; field tally in merchantable timber; and a series of tables providing the value per acre of young growth for each of the six western Districts (Regions).
Keywords: Forest fires/Historical document/Western United States/Fire damage/Damage appraisal.

252. **Greeley, W. B. 1913**. Sales of national forest timber. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 9 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In view of the large amount of merchantable material on national forests and the large annual yield from growth, the Forest Service has been frequently criticized for not selling more timber. Some advocated that large amounts of stumpage should be placed on the market because it was deteriorating from decay. The national forests, however, were situated primarily in the mountainous portions of the West, and fully 75 percent of their timber was inaccessible. Surrounding many national forests were large areas of private timber, more accessible to market and generally of better quality than the federal stumpage. In many areas in the Pacific Northwest, national forest timber was withheld from market not by the policy or methods of the Forest Service, but by the lack of railroads to transport it and by the lack of local markets to absorb it. This situation was accentuated by a slump in the lumber market for the previous three years, resulting in over one hundred idle mills in the two largest lumber-producing states – Louisiana and Washington. The markets could not absorb Government timber because they were glutted with private timber. The national forests were assumed to represent a gross property value of two billion dollars (as of 1912). In recognition of those high values, the Service refused to sell timber under adverse market conditions and thereby receive less than fair market value; low stumpage prices also contributed to poor utilization and waste of harvested trees. Furthermore, Greeley believed that large federal sales would cause private mills to hold their own timber for the future, in which case there would not be an increase in lumber supplies and lower prices for consumers and home builders in the eastern U.S. Significant drops in lumber prices would force small mills and operators out of business, allowing their assets to be acquired by large corporations so that private interests could eventually control prices and supplies in the future. Greeley also presents statistics about the recent Forest Service timber program; ten large sales sold in the previous two years ranged from 70 to 800 million board feet. Those sales represented a private investment of over 3 million dollars and construction of 150 miles of railroad. During the year before this report (1912), the Service sold 1.5 billion board feet, and applications were pending for 9 billion more. If market conditions were stable or improved, it was expected that annual timber sales from the Forests would reach 3 billion board feet. For example, sales approved for the Whitman NF in northeastern Oregon were expected to support sawmills cutting 40 million board feet annually, which was considered to be the maximum harvest level that the Whitman could sustain.
Keywords: Historical document/Community development/Forest management/Lumber production/Timber sales/ Whitman NF.

253. **Greeley, W. B. 1913**. Selling national forest timber. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This article begins with "the crucial test of public ownership and management of forests in the United States will be the power to resist an unintelligent demand for the Government to sell timber cheap, on the supposition that this will enable the public to buy lumber cheap." At the time this article was written, the Forest Service was being criticized for not selling timber cheaper and faster. It was also charged with helping private timber monopolies to gouge the public. According to the author, the Forest Service was doing just the reverse. This article contains the following sections: would it pay?; how timber is sold; the consumer pays the market price; to materially lower the retail price by increasing the cut the Government would have to overcut its forests; sales of Government timber for less than its market value would directly promote monopolistic control of timber supplies; and policy of the Forest Service. This article is similar in many respects to others that Greeley prepared during 1912 and 1913 – copies of those are also in the history archives.
Keywords: Historical document/Community development/Forest management/Lumber production/Timber sales.

254. **Greeley, W. B. 1912**. Timber sales on the national forests. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is the text of an article, although there is no clue as to what outlet (magazine, newspaper, trade journal, etc.) it was intended for. The article contains the following sections: why timber must be sold; how the size of timber sales is determined; how prices are fixed; how speculation is prevented; how monopoly is prevented; and large sales often the best for the public interests. Greeley begins by stating that the national forests contained 600 billion feet of merchantable timber, of which 350 billion feet was ripe for the axe and deteriorating in value – rapidly on areas swept by fire, gradually on areas with mature forest slowly yielding to decay. Standing timber, unlike coal deposits, can not be held in storage indefinitely. "To the extent to which the over-ripe timber on the national forests can not be cut and used while still merchantable, public property is wasted. This is the very antithesis of conservation." It was estimated that the annual growth of wood on the national forests was equivalent to 6 billion feet of lumber, which was viewed as the amount that could be cut for all time without depleting the supply. At the time this article was written, the national forests harvested not quite half a billion feet, about one twelfth the amount that could be cut by simply utilizing the growth of existing trees. Income from timber sales helped to protect and administer the forests and thereby reduce the burden on the federal treasury. For that reason, Congress was insistent that timber sales be increased. When national forest timber was sold, preference was always given to: local communities; and small operators who log on a limited basis and are not connected to large timber companies. He states that 5,653 sales were made last year (1911), of which 5,471 were for amounts under $500 in value and 5,614 for amounts under $5,000 in value. Since much timber was inaccessible, especially in the western United States, a few large sales were made with volumes ranging from 75 million to 300 million board feet, and cutting periods from 7 to 15 years. High volumes and long cutting periods were used in situations where extensive development of expensive railroad logging was necessary to harvest the timber. Every railroad built under a government timber sale contract was required to become a common (public) carrier, or to transport the logs or lumber of other purchasers of government timber. This was designed to prevent one purchaser from monopolizing all of the timber in a particular drainage or area by controlling the only feasible transportation route. Under the circumstances and stipulations of that era, Greeley estimated that the largest timber sale that could be offered to a single purchaser would be one billion board feet. Greeley also supported the use of large sales because they tended to increase the value of unharvested timber in the vicinity of sale areas by ensuring a transportation system.
Keywords: Historical document/Community development/Forest management/Lumber production/Timber sales.

255. **Greeley, W. B. 1922**. Umatilla National Forest, Oregon and Washington, visitor's map (north and south halves). Washington, DC: U.S. Department of Agriculture, Forest Service. 1:253440; Polyconic; 23" x 23" and 21" x 30"; Thematic. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a general visitor's map of the Umatilla National Forest. It occurs on two sheets – one for the north half of the Forest, the other for the south half. The base map was compiled at the Washington Office in 1922 and was based on USGS, Government Land Office, Forest Service and other surveys. The legend includes two items: the Umatilla NF boundary and adjacent national forest boundaries. Although not shown in the legend, each map also portrays zones that were assigned to different classes of livestock, such as Zone A (Cattle) and Zone A (Sheep).
Keywords: Historical map/Maps/Umatilla NF/Livestock grazing.

256. **Greeley, W. B. 1913**. Why is more national forest timber not sold? Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 4 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: At the time this article was written, the national forests contained 600 billion board feet of timber. They produced 6 billion feet a year by growth. Yet the Government reported an annual cut of scarcely half a million. Seventy-five percent of national forest timber was inaccessible to transportation. Between the Forests and their markets stood twice as much timber in private ownership. That condition was made more acute by three years of overproduction. In 1911, the sawmills of the Northwest cut less than 50 percent of their capacity, and 130 mills in the two leading lumber producing states were idle. Many purchasers of national forest timber were forced to suspend cutting because of an inability to market their product. Under such conditions, more national forest timber could by sold only by marking down prices to bargain terms. One of two things would then follow – either established mills would cut public timber instead of their own, or the market, glutted with cheap stumpage, would go to pieces. The first eventuality would not benefit the consumer since no additional lumber would be produced. The second one would lower lumber prices for a time, but the cut-throat competition would drive the small mills out of business and eventually lead to monopolies and higher prices. Greeley stated that "the Forest Service will not sacrifice the intrinsic value of $2,000,000 worth of public property or give away the timber reserve of the country by

forcing stumpage upon a glutted market." He maintains that the Forest Service is making every effort to dispose of the overripe stumpage on the Forests and bring the annual cut up to a fair portion of the yield. This policy had succeeded. Aided by the recovery of the lumber market, over 1 and 1/2 billion feet had been sold in the last 12 months. If the market is sustained, Greeley expected sales to soon reach 3 billion feet. The Forest Service was putting the public timber to use as fast as could be done without sacrificing its value or contributing to a lumber monopoly.
Keywords: Historical document/Community development/Forest management/Lumber production/Timber sales.

257. **Griffin, Alfred A. 1918**. Descriptive and cost reports of the Swamp Creek timber survey project, Wallowa National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 25 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes a timber survey project completed in 1917 by an eight-man crew (not counting the crew's cook). It includes the following sections: introduction; map (in color, showing the timber survey project area, alienated (private) land within the area, and the East Oregon Lumber Company timber sale located to the west of the project area); status and ownership; silvical description (yellow pine type, larch-fir type, grassland, and damage); logging damage (undergrowth, windfall, rock outcrops, and railroad locations); recommendations for management (local needs, timber sale policy, marking rules, brush disposal, grazing, and watershed protection); statistical summary (estimate by sections, and number of snags per section); and conclusion. The survey area was located in a trough 2 miles by 14 miles in extent on the north end of the Wallowa horseshoe, from 12 to 25 miles due north of Enterprise, Oregon. Elevations ranged from 4,700 feet on Elk Mountain at the southern end to 2,850 feet on lower Swamp Creek. The project area included 12,444 acres of government-owned land, and contained an estimated 71,636 thousand board feet of timber, almost all of which was western yellow (ponderosa) pine. A table that provides average stocking conditions for the western yellow pine type showed 39 trees per acre total (from 4 inches diameter and greater), with 24 being yellow pine, 12 Douglas-fir, and 3 western larch. The larch-fir type was noted as occurring in a narrow strip along Swamp Creek and its branches, as there was not a single solid forty [acre tract] of larch-fir anywhere in the survey area. A relatively large proportion of the area was supporting grassland (5,397 acres) dominated by bunch grass, lupine, arnica, pine grass, sedges, and weeds. It was noted that "fires have burned over all of this area repeatedly at varying intervals, resulting in a large amount of accumulated damage in fire-scarred butts, fungus and insect infestations. The repeated damage, however, is so great that over 25% of the trees show signs of firescar." The larger lodgepole pine in the area were killed out several years previously by an insect (mountain pine beetle) outbreak, although most of the lodgepole saplings were still alive. Mistletoe was a serious danger to the yellow pine reproduction, to western larch, and to Douglas-fir. Windfall was moderate except in small areas of dead lodgepole pine. The author stated that standard East-side marking rules for District 6 could be used in this area and that a large proportion of the existing overstory could be marked because of the ample reproduction and poles already established in the area. The report mentions that recreational use in the area was "nearly nothing" and that watershed protection was important in this area. The report includes numerous tables that summarize statistics by townships, species, snags, defect, and so forth; it also included three photographs or plates, none of which were present in the copy at the National Archives. This document also includes a 5-page "Cost Report" with its own title page. The cost report includes the following sections: statement of conditions; acreage and mileage; field expenses; field work costs; and office work.
Keywords: Swamp Creek/Wallowa NF/Blue Mountains/Forest inventory/Timber volume/Historical document/ Timber surveys.

258. **Griffin, Alfred A. 1916**. Descriptive report of the Burnt River timber survey project, Whitman National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 36 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes a continuation of timber survey work initiated in 1915 by Fred A. Matz (see the history archives for a report entitled "Cost report on the reconnaissance examination of the Burnt River project, 1915" for limited information about the 1915 survey). It includes the following sections: introduction; map (in color, showing the 1916 timber survey project area, patented (private) land within the area, adjacent Forest Service lands that had been previously cruised, working circle boundaries, block boundaries, and camp locations used by the timber survey party); status and ownership; silvics (western yellow pine, fir-larch, lodgepole pine, alpine, woodland, open land, forest enemies, reproduction, and undergrowth); logging conditions; management recommendations; silvical summary; and statistical summary (summary of types, defect and breakage tables, and grand summary). The survey area totalled 59,701 acres, and contained an estimated 475 million board feet of timber (the average stand on national forest lands was 8,400 board feet per acre, of which 5,000 feet was yellow pine, 1,000 feet white fir, 1,000 feet western larch, and the balance Douglas-fir). The recommendation for handling "inferior species" was to continue to offer free-use permits and to emphasize removal of white fir over 16 inches in diameter

and lodgepole pine under 10 inches in diameter. That policy was believed to represent the best option for cleaning out the "old rotten fir and lodgepole thickets on Bullrun, Elk and Last Chance creeks." The report also mentions that recreation and watershed protection was important in this area, with significant camping use by local residents and a high demand for water that was tied to irrigated areas on Burnt River and Camp Creek. The report includes numerous tables that summarize statistics by townships, species, snags, defect, and so forth. This document also includes a 6-page "Cost Report" with its own title page and contents. The cost report includes the following sections: statement of conditions; acreage and mileage; expenses; field work; office work; distributed costs; total cost; and costs per acre and per thousand board feet.
Keywords: Burnt River/Whitman NF/Blue Mountains/Forest inventory/Timber volume/Inferior tree species/Historical document/Timber surveys.

259. **Griffin, Alfred A.; Conover, Charles J. 1917**. Descriptive report of the Powder River timber survey project, Minam National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, North Pacific District. 26 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The Powder River timber survey project area covered 28,604 acres of government land, with nearly the same amount of intermingled private land. Private lands included timber patents, nine mining claims, two mill sites, several homesteads, and 720 acres of school land. There were also two homestead entries pending and a great many mining claims, all but a few of which had been long abandoned. Other private interests in the survey area included ten miles of the Sparta irrigation ditch, a short stretch of the Hogem ditch, the Balm Creek irrigation reservoir, three small sawmills with timber sales, five miles of unused transmission and telephone line of the Eagle River Electric Power Company (at that time, it was in receivership), about fifty salt troughs built by the local stock association, and a cooperative fire lookout house on Sparta Butte. The old Union-Cornucopia stage road, then a county road, traversed the project area from east to west. The survey area was located on the southwest side of the Minam National Forest between 3,500 and 6,450 feet elevation, about 20 miles north of Baker, Oregon. The area lies between the Catherine Creek-Big Creek divide on the north, the Eagle Creek Canyon on the east, and the Forest boundary on the south and west. The project was initiated in response to an application for a timber sale by Mr. Alex Allardyce of Spokane, Washington, who was interested in the timber on the associated private land. Work began on August 30th and was completed on October 15th, 1917 by a party that averaged eight men. Recommendations about logging chances were constrained by the numerous land alienations and encumbrances, and by local demands (wood requirements of local ranchers), as well as topography and merchantability. The report includes these sections: introduction; map (½" = 1 mile, in color, showing the surveyed areas, reserved areas, private land, and the project boundary); status and ownership; silvical description; logging data; recommendations for management (marking rules, etc.); statistical summary (estimates by sections, number of snags per section); and conclusion. The average standing volume for the survey area was 6,300 board feet per acre, of which 4,700 feet was ponderosa pine and the rest primarily Douglas-fir. Mature stands of western yellow (ponderosa) pine comprised over one half of the project area. A table providing average stocking conditions for the western yellow pine type showed 24 trees per acre total (from 4 inches diameter and greater), with 15 being yellow pine, 5 Douglas-fir, 1 western larch, and 3 white (grand) fir. About one-seventh of the survey area consisted of the larch-fir type, occurring mostly at high elevations and on north and east aspects. Douglas-fir was the predominant species in that type below 5,500 feet elevation and going east from the Goose Creek area. An average stand table for the larch-fir type had 68 trees per acre, with 6 being yellow pine, 22 Douglas-fir, 11 western larch, 20 white (grand) fir, 5 Engelmann spruce, and 4 lodgepole pine. Sagebrush and grassland types also occurred in the area. Fires had been noted as having "burned over all of this area repeatedly, resulting in a large amount of accumulated damage in fire-scarred butts, fungus and insect infestations, destroyed humus and deficient reproduction. Most of the burns are 20 to 40 years old or older. There are also two small areas on Velvet Creek burned over in 1917 on one of which, in fir-larch timber, most of the trees appear to be dead over about 80 acres. The big fire of 1910 denuded an area of about one thousand acres on the high flat between Big and Lick Creeks. This is rapidly being recovered with lodgepole and larch-fir, the natural forest types." Dwarf mistletoe was found to be a serious damage on the western larch, having killed many of the larger trees. Harvest areas were already common in the area. The west side of Medical Springs had already yielded a large amount of free-use material and more was being required each year for posts, firewood, and construction on the ranches in the valley below. In an area south of Sparta, cuttings had been made by prospectors and by some of the mines. Much of the survey area was also important for spring and fall cattle grazing. It was important to practice conservative logging and careful grazing due to the high watershed protection values of the area. Many tables are included that summarize the survey results by species, location, logging chance, etc. Attached is a four-page Cost Report dated January 26, 1918. It includes the following sections: conditions; acreage and mileage; field expenses; field work costs; office work; and total cost of the project.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Minam NF/Powder River/Wall-

owa-Whitman NF/Fire effects/Timber surveys.

260. **Griffiths, David**. **1903**. Forage conditions and problems in eastern Washington, eastern Oregon, northeastern California, and northwestern Nevada. Bulletin No. 38. Washington, DC: U.S. Department of Agriculture, Bureau of Plant Industry. 52 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes an extensive survey in the western United States to determine grazing conditions in the Great Basin and Columbia River areas. It constitutes an early survey of sheep ranges in which the author found moist mountain meadows that were entirely devoid of vegetation and experiencing severe soil erosion. For example, a complete collection of the plants growing in a heavily-grazed meadow found not a single perennial species, and no annuals exceeding 2 inches in height. Few shrubs other than snowbrush ceanothus had not been damaged by sheep browsing; even the small ponderosa pines had been fed upon. The following topics are discussed in this report: changes in the handling of the Washington ranges; condition and plant species of the ranges; meadows and hay crops; reclamation of swamp lands (mainly in the area of the Malheur Wildlife Refuge in southeastern Oregon); plants injurious to livestock; weeds of meadows and pastures; diseases affecting forage crops; and native grass species considered worthy of cultivation.
Keywords: Range management/Grazing/Great Basin/Eastern Oregon/Eastern Washington/Northern California/Nevada/Historical document.

261. **Guthrie, Jno. D. 1924**. Development of new Oregon pine section. The Timberman. 25 (October): 49-51, 127-128. **Notes**: A photocopy of an original.
Abstract: This informative article describes how the Union Pacific Railroad came to Burns, Oregon, a development that was instrumental in allowing the extensive pine timberlands of the southern Blue Mountains to be developed and exploited for the first time. As a result of informal applications in 1922, the Forest Service began cruising and laying out a huge block of timber on the Malheur National Forest. It was known as the Bear Valley unit. One of the main conditions of a timber sale involving that timber block was that a standard-guage, common-carrier railroad be built from Crane into the yellow pine timber of the Malheur NF. A block containing 890 million board feet of timber was advertised in the spring of 1923. Although considered huge by current standards, that offering was viewed as only a small part of the 6.7 billion board feet that was tributary to Burns and the proposed railroad. The Bear Valley block included in the sale comprised 67,400 acres of the headwaters of the Silvies River. The volume included in the sale comprised 770 MMBF of ponderosa pine, 78 MMBF of Douglas-fir, 30 MMBF of western larch, 10 MMBF of white fir, and 2 MMBF of lodgepole pine. The article also includes an interesting and detailed account of how the railroad was developed into northern Harney and southern Grant counties.
Keywords: Blue Mountains/Community development/Forest history/Grant County OR/Harney County OR/Historical document/Lumber production/Ponderosa pine/Timber sales.

262. **Guthrie, John D. 1927**. Ingenious oufit for bucking lodgepole pine for cordwood. Photo Number 220233. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3" x 5½". **Notes:** An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. Information provided on the reverse of the card includes these items: negative no. 220233; state: Oregon; national forest: Umatilla; description: "Ingenious outfit for bucking lodgepole pine for cordwood. Bucks 5 trees at once into 8-ft. lengths. Neebel, Dayton, Wash., inventor and user"; taken by Jno. D. Guthrie; date: July 1927.
Keywords: Umatilla NF/Historical photograph/Pomeroy RD/Cordwood.

263. **Guthrie, John D. 1927**. Slash treatment and sale clean-up for Wade sale. Photo Number 220237. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3" x 5½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of good quality; focus is sharp throughout the image. The following information is provided on the back of the hard-card on which the print is mounted – location: Umatilla N. F., Oregon; description: Wade sale. Well piled and area cleaned up; taken by: Jno. D. Guthrie; date: July 1927. This photograph shows a timber sale scene following sale clean-up activities. There is a large slash pile containing ponderosa pine boughs and branch wood in the left foreground. The middleground view shows several stacks of split wood (firewood size). The background view shows dryer mixed-conifer forests with both ponderosa pine and Douglas-fir easily distinguished in the scene.
Keywords: Historical photograph/Umatilla NF/Fuelwood/Slash disposal/Timber harvesting.

264. **Guthrie, John D. 1927**. Tollgate-Bone Spring road. Photo Number 220210. U.S. Department of Agriculture, For-

est Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size:** 3½" x 5½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is attached to an 8" x 9" camera point study report form (Form R6-E13). Information provided by the form includes these items: CPS # 20; date: July, 1927; location: Tollgate-Bone Spring road; photo no. 1; light: fair; picture taken by: J. D. Guthrie; description of scene, bringing out salient points of study which will make it of value for future reference – attach additional sheet if necessary: "Photograph #220210 taken in July 1930 by John D. Guthrie. Tollgate-Bone Spring road.".
Keywords: Umatilla NF/Historical photograph/Tollgate-Bone Spring road/Walla Walla RD.

265. **Hafenrichter, A. L.; Mullen, Lowell A.; Brown, Robert L. 1949**. Grasses and legumes for soil conservation in the Pacific Northwest. Miscellaneous Publication No. 678. Washington, DC: U.S. Department of Agriculture. 56 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This publication describes the use of grasses and legumes for soil conservation on farms and ranches in the Pacific Northwest. The information is based on 12 years of observational and testing work by the Soil Conservation Service in its nurseries, and on farms in soil conservation districts, under actual field conditions. More than 7,000 accessions of grasses and 500 accessions of legumes were observed and tested in Soil Conservation Service nurseries. Of that number, over 5,700 were collected by the Service from native vegetation stocks in the northwestern United States.
Keywords: Historical document/Plant ecology/Erosion control/Grasses/Pacific Northwest/Legumes.

266. **Haig, Irvine T. 1932**. Second-growth yield, stand, and volume tables for the western white pine type. Technical Bulletin No. 323. Washington, DC: U.S. Department of Agriculture. 67 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is one in a series of bulletins describing management of western white pine forests in northern Idaho and adjacent parts of northeastern Washington and northwestern Montana. This bulletin provides yield tables, volume tables, and growth/yield curves for white pine forests growing on a range of productivities and under a variety of conditions. Appendix material describes the yield table, stand table, and volume table materials, and the techniques used to prepare them, as well as a statistical analysis of the results.
Keywords: Western white pine/Northern Idaho/Northeastern Washington/Northwestern Montana/Timber yields/Volume tables/Historical document.

267. **Haig, Irvine T.; Davis, Kenneth P.; Weidman, Robert H. 1941**. Natural regeneration in the western white pine type. Technical Bulletin No. 767. Washington, DC: U.S. Department of Agriculture. 99 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This classic bulletin brings together information about natural regeneration in the white pine forests of the Inland Empire region of the western United States. The information is based on about 25 years of research results, and about 30 years of national forest management experience. The following topics are discussed: composition and character of the forest; climatic factors affecting regeneration; susceptibility to injury; seed production and dissemination; germination and survival; seedling establishment; early stand development; and acceptable regeneration methods for white pine forests. It includes some interesting insights about early forest management attitudes, as illustrated with this quote: "The low values are due to high susceptibility to heart rot of western hemlock, grand fir, and some other species, and to the fact that the selling price of lumber manufactured from these species is often insufficient to meet production costs even if nothing were paid for the standing timber. Where trees of such species are not defective, the Forest Service policy has been to leave them uncut in the hope that at some future time they can be sold at a profit. But leaving these low-value species on areas that are cut over encourages their reproduction and tends to decrease the proportion of western white pine in the reproduction an undesirable result both silviculturally and economically."
Keywords: Western white pine/Northern Idaho/Northeastern Washington/Northwestern Montana/Inland Empire/Silvics/Historical document.

268. **Haines, Francis**. **1938**. The northward spread of horses among the plains Indians. American Anthropologist. 40: 429-437. **Notes**: A photocopy of an original.
Abstract: This paper extends a debate about when American Indians first gained access to the horse. A previous article by the same author concluded that it was unlikely that Indians obtained their basic breeding stock from strays originating from either the Coronado or DeSoto expeditions. This article takes up where the previous one left off, approximately in the year 1600, by dealing with the northward spread of the horse from Spanish settlements. The center from which the horse spread to the Plains Indian tribes was the stock-raising area around Santa Fe, with the

spread being slow at first but later more rapid until the entire plains and plateau regions eventually being supplied. The remainder of this article describes in great detail the spread of horses throughout the Great Plains and western United States. For the Blue Mountains area of northeastern Oregon, the author's spread map (figure 1) shows that the horse arrived there around 1690 or 1700. Although this article does not include any information about herd sizes, it does provide an interesting speculative account about an evolutionary event that profoundly influenced not only the indigenous culture of the West, but also the condition of grassland environments that provided forage for large horse herds.
Keywords: American Indians/Historical document/Horses/Pacific Northwest history.

269. **Hall, Frederick C. 1966**. Ecology as a tool in multiple-use management on forested areas. Proceedings of the Society of American Foresters. 224-228. **Notes**: An original copy.
Abstract: Multiple use in the U.S. Forest Service was governed by law (the Multiple Use-Sustained Yield Act of 1960) and by directives. This article, written by the originator of Region 6's ecology program and its first Regional Ecologist, describes how ecology could assist with implementation of multiple-use management on forested lands of the Pacific Northwest. Hall believed that multiple-use management involved four basic elements or objectives – an increased yield of products and services from a given area while simultaneously maintaining resource productivity; planning and management dependent upon the skill and foresight of the land manager; an analysis of the inherent capability of the land to produce a sustained yield of resources or services without impairment of the site; and satisfying the needs and desires of people or society at large. Ecology for multiple use was largely concerned with classification and characterization of plant communities, or an evaluation of the kind, amount, and characteristics of the vegetation, which in turn depended upon the interrelationships of soil, biotic factors, and geomorphology. This article includes the following sections: introduction; ecology for multiple use; geomorphology; soil; biotic factors; vegetation; ecological requirements; illustration of multiple use ecology; vegetation characteristics; multiple use considerations; and summary. Hall believed that multiple use reactions were always present on forested areas because a stand was composed of trees, ground vegetation, animals, and water. Land management which changed the vegetation or soil in any way caused a chain reaction – a multiple use reaction – affecting animals, watershed, and plants. Basic and applied ecology was a fundamental tool which the land manager must use to evaluate those interactions.
Keywords: Historical document/Plant ecology/Multiple-use management/Plant communities.

270. **Hall, W. L. 1901**. View down the Columbia River. Photo Number 22210. U.S. Department of Agriculture, Forest Service. **Locality**: Grant County, Oregon. **Size**: 5" x 6½".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was taken between Biggs and Rufus, Oregon, near the old town of Grant, Oregon, on the bluffs above the river. Information provided on the back of the card includes the following items: locality: Grant, Oregon; date: Sept.14,1901; field no. 22210; subject: "View down the Columbia R. Mt. Hood at the left 60 miles away"; col no.: 38 Wa 13; relative situation: "Bluff several hundred feet above river at Grant"; exposure: 1/5"; stop: 128; light: bright; hour: 11: A. M.; direction: W.; taken by: W. L. Hall.
Keywords: Grant OR/Columbia River/Sherman County OR/Grant County OR/Historical photograph/Mount Hood.

271. **Hallauer, Frank J. 1939**. Lumber requirements for nonfarm residential construction. Miscellaneous Publication No. 347. Washington, DC: U.S. Department of Agriculture. 39 p. **Notes**: An original copy. Issued in May, 1938.
Abstract: As part of the forest survey program authorized by the McSweeney-McNary Forest Research Act, this report was prepared in an effort to estimate future lumber demand as related to nonfarm residential construction. The survey that formed the basis for this report was completed in large part by the Forest Service's various forest and range experiment stations located throughout the country. This report contains the following sections or chapters: prospective volume of residential construction; lumber per family living unit; additions, alterations, and repairs; estimated lumber requirements; replacement and probable life of building; and summary.
Keywords: Economics/Home construction/Lumber production/Historical document.

272. **Hallin, William E. 1959**. The application of unit area control in the management of ponderosa-jeffrey pine at Blacks Mountain Experimental Forest. Technical Bulletin No. 1191. Washington, DC: U.S. Department of Agriculture. 96 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This bulletin discusses the following topics as related to forest management studies at Blacks Mountain Experimental Forest in northeastern California: silvicultural studies, including sanitation-salvage cutting, regeneration, and growth after harvest cutting; logging costs; and application of the unit-area control method of forest regulation. Appendixes describe a ponderosa pine risk classification system and provide a comprehensive management

plan for the Blacks Mountain Experimental Forest.
Keywords: Ponderosa pine/Jeffrey pine/Blacks Mountain Experimental Forest/Forest management/Forest regulation/Northern California/Historical document.

273. **Hansen, Henry P. 1943**. A pollen study of a subalpine bog in the Blue Mountains of northeastern Oregon. Ecology. 24 (1): 70-78. **Notes**: A photocopy of an original.
Abstract: This article reports on one in a series of studies on post-Pleistocene vegetation history and general climatic trends in the Pacific Northwest. The forest succession is interpreted from pollen profiles of peat bogs and lake sediments. The peat bog used in this study was located at Mud Lake, one of the Anthony Lakes that lie near the crest of the Blue Mountains. Peat samples were obtained at several locations from a fairly wide sedge zone that extends out about 50 to 100 feet from the lake shore. After analyzing pollen obtained from the peat cores, it was found that tree pollen from three life zones was preserved in the peat profiles. The Hudsonian Zone, with lodgepole and whitebark pines predominant, was best represented in the sediments. The Canadian Zone was not characterized by a particular tree species, although lodgepole pine pollen was common for that zone also. The Arid Transition Zone was best represented by ponderosa pine pollen. Whitebark pine showed a general decline from the bottom of the profiles toward the surface, whereas lodgepole pine was most common in the upper half of the profiles. The relative abundances of western larch and lodgepole pine may indicate fire relationships, or possibly climatic fluctuations. Pollen from Engelmann spruce and subalpine fir were uncommon in the sediments, which the author attributes to their low fire resistance and slow recovery after fire.
Keywords: Climate/Engelmann spruce/Fire ecology/Forest ecology/Historical document/Lodgepole pine/Northeastern Oregon/Plant succession/Ponderosa pine/Presettlement vegetation/Subalpine fir/Wallowa-Whitman NF/Whitebark pine/Paleobotany/Pollen analysis/Anthony Lakes/Western larch.

274. **Hansen, Henry P. 1942**. Post-Mount Mazama forest succession on the east slope of the central Cascades of Oregon. The American Midland Naturalist. 27: 523-534. **Notes**: A photocopy of an original.
Abstract: This article reports on a pollen analysis of four bogs located near the crest of the Cascade Range at increasing distances from Mount Mazama, the prehistoric volcano whose eruption formed the caldera that now holds Crater Lake in the Cascade Mountains of southern Oregon. The volcanic eruption resulted in the deposition of a pumice mantle that extends with diminishing thickness to the east and north of Crater Lake. In all four areas studied, lodgepole pine was the predominant species when deposition of pollen-bearing sediments began. In some areas, the species distribution changed through time, primarily in response to plant succession and the depth of the pumice deposits. There was little evidence in the profiles for climatic trends, suggesting that vegetation changes are due more to succession and pumice depth than a cooling or warming episode. The depth of the peat profiles suggest that the eruption of Mount Mazama occurred sometime between 5,000 and 7,500 years ago.
Keywords: Climate/Historical document/Lodgepole pine/Plant succession/Presettlement vegetation/Paleobotany/Pollen analysis/Cascade Mountains/Mount Mazama.

275. **Hansen, Henry P. 1944**. Postglacial vegetation of eastern Washington. Northwest Science. 18 (4): 79-87.
Notes: A photocopy of an original.
Abstract: This article reports on a pollen analysis of four sedimentary columns located in eastern Washington and their translation into postglacial vegetation and climate. Two of them were collected from swamps that developed in scabland channels south of the Spokane ice border (the Spokane glacial lobe that developed during the Wisconsin era of the late Pleistocene), while the other two were from sedimentary beds lying upon glacial drift within the glaciated region. In all four sedimentary columns, lodgepole pine was the predominant tree species as the ice retreated from the Columbia Basin. This result agrees well with lodgepole's status as a preeminent pioneer species that is ecologically adapted to colonization of harsh sites. Western white pine was more common in the lower portions of the sediment profiles, indicating that climatic conditions were cooler and moister then than currently. As the glaciers retreated and climatic conditions became warmer and dryer, ponderosa pine expanded at the expense of lodgepole pine. The author also describes the relative distributions and patterns of grasses, chenopods-composites, and certain other non-arboreal species.
Keywords: Climate/Historical document/Lodgepole pine/Eastern Washington/Plant succession/Ponderosa pine/Presettlement vegetation/Paleobotany/Pollen analysis/Western white pine.

276. **Hanzlik, E. J. 1925**. Growth of reserve trees on western yellow pine cut-over areas in Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 4 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The growth of reserve trees in cut-over areas in the pine type of eastern Oregon was investigated because it was known that certain trees had a greatly increased growth rate after cutting, whereas other trees had very little

growth increase or none at all. Since published literature and prevailing attitudes of the time assumed that all reserve trees experienced a greatly increased growth after cutting, it was also believed that volume increment was increasing at a high rate. In this study, a timber sale unit (the Davis Creek unit on the Wallowa National Forest) was examined about ten years after cutting (harvest occurred in 1915-1916). A number of increment borings were taken on reserve yellow pine trees in the unit; sampled trees were classified as either bull pines or mature pines. Reserve trees were also classified as to their relationship in the uncut stand by determining how many trees had been removed within a 50-foot radius of them. For analysis purposes, the sampled trees were grouped into three classes: trees always in the open; trees growing in clumps and natural stands; and trees which had been released on one or more sides by the harvest. Two tables are included that present the results of the analysis: one table pertains to mature yellow pine, the other to bull (young) pines. The tables clearly show a substantial increase in diameter growth for trees that were released (60.2% for mature pines; 50.9% for bull pines). They also show that growth continues pretty much as it had been for trees that were not released, as if the harvest had not occurred. Based on this study involving a limited number of sample trees, and based on observations made in other timber sale areas in the eastside pine type, the author concludes that reserve trees which have always grown in the open or were left in natural clumps (i.e., the trees were in a clump before the harvest, and the whole clump was retained as reserve trees) will show little or no increased growth on cut-over areas. Reserve trees that were released or partially released (released on less than all four sides) could be expected to demonstrate a considerable increase in diameter growth following cutting.
Keywords: Ponderosa pine/Timber yields/Historical document/Wallowa NF/Cutover areas/Diameter growth/Maturity selection system/Selective cutting/Blue Mountains.

277. **Hanzlik, Edward John**. **1928**. Trees and forests of western United States. Portland, OR: Dunham Printing Company. 128 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: This book includes the following chapters: trees and their growth; classification of plants; the western forest regions; forest statistics; the western national forests; tree descriptions; Pacific coast hardwoods; and uses of western woods.
Keywords: Historical document/Pacific Northwest/Silvics/Dendrology/Black cottonwood/Douglas-fir/Engelmann spruce/Incense cedar/Lodgepole pine/Ponderosa pine/Red alder/Sugar pine/Western larch/Western white pine/ White fir.

278. **Hatton, John H. 1920**. Live-stock grazing as a factor in fire protection on the national forests. Department Circular 134. Washington, DC: U.S. Department of Agriculture. 11 p. **Size**: 6” x 9”.
Notes: A photocopy of an original.
Abstract: The purpose of this circular is to discuss the opportunity to use grazing management as a tool to afford greater protection against wildfire. It includes discussion on the following topics: history; influence of grazing upon the number of fires; influence of grazing on the intensity and area of fires; and additional persons in the forest. Some conclusions are: grazing can be used to remove rank vegetation growth; it would be desirable to develop water and trails for currently unsuitable rangeland; close consideration needs to be paid to the type of stock used when fire protection is desired; location of driveways and trails should be established with fire control objectives in mind; overgrazing may be justified in certain areas because of the fire prevention benefits it provides; the distribution of ligntning should be studied to see if grazing could be coordinated with high-lightning zones; there are opportunities to better utilize the grazing personnel in the forests for fire control; and closer coordination of Forest Service grazing planning and fire planning is needed.
Keywords: Fire control/Fire prevention/Grazing/Historical document/Range management/Sheep grazing.

279. **Hayes, G. Lloyd**. **1941**. Influence of altitude and aspect on daily variations in factors of forest-fire danger. Circular No. 591. Washington, DC: U.S. Department of Agriculture. 38 p. **Size**: 6” x 9”.
Notes: An original copy. Issued in February, 1941.
Abstract: Altitude and aspect exert a strong influence on climate. The relationship between altitude and aspect, and climate or vegetation zones or life zones, have been commonly studied. This report explores the relationship between those two geographic variables and daily variations in forest-fire danger, as estimated using 24-hour weather records obtained on the Priest River Experimental Forest. It contains the following sections: introduction; description of study area; methods and instruments used; results of daily measurements; summary of results; and literature cited. Fire behavior was found, as expected, to be more dangerous during the day than at night and more dangerous on south slopes than on north. Less difference in fire-behavior rating between day and night conditions and between aspects was found at high elevations than at low, however, indicating that the higher the elevation, the more burning conditions at night tend to be like day conditions, and the more north-aspect conditions tend to be like south-aspect.

Keywords: Forest fires/Historical document/Fire weather/Mountain climate/Fire danger/Priest River Experimental Forest.

280. **Hays, W. M. 1911**. Area and estimated amounts of standing timber on the national forests in the state of Washington. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 1 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is a one-page summary of information that was originally included in a memorandum of October 11, 1911 to Honorable S. Warburton and signed by W. M. Hays. It shows that the area of the Wenaha National Forest was 320,000 acres (portion in Washington only) and that the volume of standing timber was unknown. The total timber stand on the Wenaha was shown to be 1,440,000 MBF in a footnote to the table, but that figure pertained to the entire Forest (including Oregon portion). The total acreage of the Wenaha was 792,000 acres, including the Oregon portion.
Keywords: Historical document/Timber volume/Wenaha NF/Washington.

281. **Headsten, Edward W. 1910**. Annual silvical report: Colville National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Colville National Forest]. 15 p.
Notes: A digital version of this report is available; filename: Colville2. Copied from Research Compilation File material available on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes the following topics as they pertain to the Colville National Forest in northeastern Washington: forest trees of the Colville National Forest; shrubs of the Colville National Forest; forest types; silvics; and dangers and diseases.
Keywords: Historical document/Colville NF/Northeastern Washington/Silvics/Western white pine/Ponderosa pine/Lodgepole pine/Western larch/Alpine larch/Engelmann spruce/Western hemlock/Douglas-fir/Subalpine fir/Grand fir/Western redcedar/Pacific yew/Willows/Quaking aspen/Black cottonwood/Water birch/Thinleaf alder.

282. **Hedgcock, George G. 1915**. A disease of pines caused by *Cronartium pyriforme*. Bulletin No. 247. Washington, DC: U.S. Department of Agriculture. 20 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin describes limb rust, a disease affecting lodgepole and ponderosa pines in the western United States. The fungus and its life cycle are discussed, as well as its impact on host plants. It also describes measures for eradication and control of the disease.
Keywords: Tree diseases/Limb rust/Ponderosa pine/Lodgepole pine/Historical document/Cronartium pyriforme.

283. **Heintzleman, B. F. 1913**. North slope sub-type of the Blue Mountains. Annual Silvical Report. Sumpter, OR: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 10 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The north slope sub-type was delineated as a subdivision of the general yellow pine slope type of the Blue Mountains region. The designation of this sub-type recognized that the physical conditions of the sites on which it occurs differ sufficiently from those of the main slope type to produce a stand of different quality and mode of growth, and one that demanded a different type of management. It was not classified as its own type because it had several points of similarity with the slope type. It was found at the same elevations and on soils of about the same quality. Both had the same tree species, although the percentage of each species may have varied significantly from one type to another. The typical stand of the slope type was almost pure western yellow pine, with a small percentage (generally less than 20%) of western larch, Douglas-fir, grand fir, and lodgepole pine. The slope-type stand was open and the ground remarkably free of debris. The typical north slope sub-type stand was comprised largely of western larch, lodgepole pine, Douglas-fir, and grand fir, with an occasional yellow pine in the mixture. The stands were very dense and the amount of debris on the ground was very large. This report includes the following sections: occurrence of the north slope sub-type; life history of north slope stands; economic value; and management. The physical feature that determined to a large extent if an area was “north slope” or “slope” was moisture in the soil and the air. A good supply of moisture during the growing season was very favorable to the four inferior species named above and yellow pine cannot compete with them successfully. Their reproduction was so dense and fast-growing that yellow pine was choked out. The few yellow pines occurring in the north slope sub-type undoubtedly secured a foothold in openings made by windfall or another disturbance. The name “north slope sub-type” was rather misleading because slope direction or aspect was not always useful as an indicator for this type. A cool, moist situation was the only prerequisite for its presence since it was often found on moist flats, the lower slopes and bottoms of canyons regardless of aspect, and the summits of flat-topped ridges. The best yellow pine trees were often found near the boundary between the slope type and the north slope sub-type. Areas on which yellow pine reproduction could not be counted upon were classified as the north slope sub-type.

Fire was the most important factor determining the life span of north slope stands as well as their species composition. When a fire occurred, much of the lodgepole pine was killed outright. Grand fir, Douglas-fir, and larch were badly injured, but were seldom killed. Reproduction following fire was generally a mixture of lodgepole pine, Douglas-fir, and grand fir on the greater part of the burned area, with larch and lodgepole pine predominant in the moister areas. When lodgepole pine regeneration occurred, it would grow rapidly to a size of about 6 inches in diameter, but would then slow down and would eventually be overtopped and killed by the other species in the mixture. The timber of this type had very little value at the time this report was written. However, the author felt that they would increase in value in 10 or 15 years due to a general increase in lumber prices and the decreasing supply of better species. It was very evident that natural reproduction of yellow pine could not be obtained in this type. If natural reproduction was necessary, the author believed that the best composition that could be hoped for was one featuring Douglas-fir and larch, which would require discriminating against lodgepole pine and grand fir during logging. The author believed that if large timber sales in the north slope sub-type became feasible in the future, then artificial regeneration (tree planting) should be considered as a way to control the species composition. The author concludes by stating that western white pine should be considered for this type, especially if a planting program is initiated at some point in the future.
Keywords: Blue Mountains/Historical document/Whitman NF/Ponderosa pine/Douglas-fir/Lodgepole pine/Western larch/Fire effects/Forest ecology/Forest management/Forest types/Inferior tree species/Grand fir/Western white pine/Tree planting/North slope type.

284. **Heisley, Marie Foote**. **1933**. Our forests: what they are and what they mean to us. Miscellaneous Publication No. 162. Washington, DC: U.S. Department of Agriculture. 34 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This document describes forests of the United States, and provides some history of their management. The following topics are discussed: what the forest is; forest regions of the United States; how our forests serve us; enemies of the forest; forestry in the United States; and timber – a vital national resource.
Keywords: Historical document/Forest history/Forest management/Tree physiology.

285. **Helphenstine, R. K., Jr. 1938**. Selection, installation, finish, and maintenance of wood floors for dwellings. Circular No. 489. Washington, DC: U.S. Department of Agriculture. 26 p. **Size**: 6” x 9”.
Notes: An original copy. Issued in July, 1938.
Abstract: The popularity of wood for floors of dwellings dates back to pioneer times, when our forefathers used thick, hewed sections of log smoothed as far as possible on one face with an adz and laid edge to edge to make their puncheon floors. Later, during colonial days when sawed lumber became available, planking of random widths fastened down with wooden pins was used as flooring. It was not until nearly the middle of the nineteenth century that the planing mill made its appearance, and the first product made in it was flooring, probably of a pattern somewhat approaching that now produced. In modern homes, wood is still the favorite flooring material with the possible exception of the bathroom and kitchen. This circular includes the following topics: introduction; woods used for floors; the subfloor; the finish floor; laying the finish floor; floor finishing; and floor maintenance.
Keywords: Wood floors/Historical document/Wood utilization.

286. **Herman, F. R. 1954**. A guide for marking fire-damaged ponderosa pine in the southwest. Research Note No. 13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 4 p. **Notes**: A photocopy of an original.
Abstract: Following a severe fire in ponderosa pine forests of the Southwestern United States, a pressing need is to salvage dead or dying trees. However, all trees with a good chance of survival should be retained as an actual or potential seed source to help restore forest cover through natural regeneration. Artificial regeneration will be needed on large areas, but that expensive practice need not be used in situations where there is a good chance of natural reseeding. This note describes the results of a study in the Fort Valley burn of July 1948 north of Flagstaff, Arizona. Three months after the fire, a variety of trees were selected for study, ranging across a range of size classes and fire damage severities. Three factors were found to be closely related to a tree’s survival: 1) length of live crown killed; 2) presence or absence of red turpentine beetles; and 3) fire intensity in the area around the tree. Three fire intensity classes were used in the study: light surface fire; heavy ground fire; and combination of ground and crown fire. Other damages studied were: extent of cambial injury at stump height; height of bark scorch; and presence or absence of a burned-out stump within 10 feet of the tree. Tables are presented which relate tree survival to length of live-crown burned, and to fire intensity. The note ends with a proposed marking guide based on the length of live-crown burned and fire intensity results from this study.
Keywords: Fire effects/Forest fires/Historical document/Ponderosa pine/Sanitation-salvage cutting/Southwestern United States.

287. **Hermann, F. J. 1966**. Notes on western range forbs: Cruciferae through Compositae. Agriculture Handbook No. 293. Washington, DC: U.S. Department of Agriculture, Forest Service. 365 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: Annotated range plant collecting by the Forest Service began in 1907. The earliest collections, however, were deposited in the United States National Herbarium. In 1910, the Forest Service Herbarium in Washington DC was started. Serial numbering of plants deposited in the Forest Service Herbarium started on August 4, 1911. This handbook was based on voucher specimens deposited in the Forest Service Herbarium, in addition to other sources. In general, forbs were not considered to be as important as grasses as range forage, but their great number, diversity, and ubiquity caused them to be of great importance to both livestock and wild ungulates such as deer and elk. The forbs included in this handbook were selected to continue the work initiated by William A. Dayton (see "Notes on western range forbs: Equisetaceae through Fumariaceae" in the history archives for the first volume in this series). This book includes important range forbs found in the eleven far-western United States. Not only does this guide provide detailed descriptions for each species, but many are illustrated with a high quality black-and-white photograph or line drawing.
Keywords: Botany/Historical document/Plant identification/Livestock forage/Western United States/Forbs.

288. **Hewett, D. F. [1915?]**. Canyon, North Fork John Day River above Crane Creek. Photo Number 189. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 8 S., R. 35 E. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. Print quality is good, although some areas of the background are blotchy. The picture is a black and white photograph. The vegetation is composed of small to medium size coniferous trees. The species composition appears (foreground) to be western larch, lodgepole pine, and Douglas-fir. In the middleground, the species appear to be ponderosa pine and Douglas-fir. The upper end of the North Fork John Day River is located in the center of the photo. Dredge tailings are also noted in the photo. Caption or title of the photograph is: "Canyon, N. Fork John Day River above Crane Creek.".
Keywords: Historical photograph/Umatilla NF/North Fork John Day River/Dredge tailings.

289. **Hewett, D. F. 1915**. Ritter Hot Springs, Middle Fork John Day River. Photo Number 211. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Ritter, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph of a slope near (above) the Ritter Hot Springs. The photographer was assigned to the U. S. Geological Survey. Print quality quality is good, with most areas in sharp focus. In the foreground, a small portion of a roof is visible in the lower right-hand corner of the photograph. The vegetation is comprised of grass, juniper, ponderosa pine, and bitterbrush. The soils appear to be shallow, with an extensive area of basalt rimrock present across most of the middleground area. Several domestic livestock or wild ungulate trails appear in the photograph.
Keywords: Historical photograph/Ritter Hot Springs/Ritter OR/Umatilla NF/Rimrock.

290. **Hewett, D. F. 1915**. View down John Day Valley. Photo Number 202. U.S. Department of Agriculture, Forest Service, Malheur National Forest. **Locality**: John Day, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing a view down the John Day Valley in northeastern Oregon, apparently taken from west of John Day, Oregon (somewhere between John Day and Prairie City) and looking east down the valley (toward John Day, although the town itself is not visible in the photograph since it is situated in a valley and this photograph was taken from plateau above the general level of the town itself). Print quality is moderate to good, with most views in sharp focus. The far background shows the Aldrich Mountains in silhouette. In the center of the photograph is the John Day River, showing several areas where the river is adjoined by mid-height or tall shrubs. [Note: contrast this photograph with one acquired by Waldemar Lindgren in 1900 from almost the same spot (see Lindgren 1900, "Valley of south fork [main stem] of John Day River" in the history archives). Lindgren's photograph shows less development than this photograph and a better representation of woody vegetation along the river.].
Keywords: John Day Valley/John Day River/Historical photograph/John Day OR/Prairie City OR/Aldrich Mountains/Malheur NF.

291. **Hewett, D. F. [1915?]**. Zonal banding of vegetation. Photo Number 196. U.S. Department of Agriculture, Forest Service, Malheur or Wallowa-Whitman National Forests. **Locality**: T. 11 S., R. 36 E. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing vegetational zonation in a small area. The photographer

was assigned to the U. S. Geological Survey. Print quality is good, with both the foreground and background in clear, sharp focus. The foreground is an open scab of sagebrush and juniper. The soils appear to be shallow and quite rocky. The middle and background is composed of shrubs (mountain-mahogany and sagebrush) and various conifers (juniper, ponderosa pine, and Douglas-fir).
Keywords: Historical photograph/Malheur NF/Vegetational zonation/Wallowa-Whitman NF.

292. **Hill, George William, editor**. **1906**. Yearbook of the United States Department of Agriculture, 1905. Washington, DC: U.S. Department of Agriculture. 815 p. **Size**: 6" x 9". **Notes**: An original copy (fair to poor condition).
Abstract: The annual report of the Department of Agriculture was produced in two volumes – the first part consisting of a "personal" report from the Secretary of Agriculture to the President of the United States and a detailed report from each division chief in the Department to the Secretary; the second part was a yearbook produced as a mass printing (500,000 copies) and designed as a way to communicate the "latest and best practical and scientific information" from the department. This accession is the yearbook for the U. S. Department of Agriculture for the year of 1905. It is organized as three sections – part I is the personal report of the secretary and was included to give readers a general report about the operations of the deparment (122 pages); part II consists of a set of papers prepared by various offices or scientists in the department and communicates recent scientific developments and technology (440 pages); and part III is an appendix providing mostly statistical information of interest to the farming public (production figures for various crops and commodities, by state or region of the country). Some articles in part II that are related to forestry or wildlife management include: the gypsy and brown-tail moths and their European parasites; how to grow young trees for forest planting (this article is also present in the history archives as a separate accession; see Sterling 1906); insect enemies of forest reproduction; waste in logging southern yellow pine; and federal game protection – a five years' retrospect. Of particular interest is a 9-page article in the appendix entitled "progress of forestry in 1905." Since 1905 marked the year that the forest reserves were transferred from the Department of Interior to the Department of Agriculture, this progress report provides an interesting historical insight into how the transfer occurred, the status of forest reserve withdrawals (by state) as of 1905, plans for future additions to the forest reserve system, and so forth.
Keywords: Nursery practices/Tree planting/Historical document/Agriculture/U.S. Forest Service history.

293. **Hill, Robert R. 1917**. Effects of grazing upon western yellow-pine reproduction in the national forests of Arizona and New Mexico. Bulletin No. 580. Washington, DC: U.S. Department of Agriculture. 27 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Describes the results of a study initiated in 1910 to determine the effects of cattle and sheep grazing on ponderosa pine reproduction. The study was completed on the Coconino NF, within a radius of 25 miles of Flagstaff, Arizona. Grazing damage was summarized by seedling height class, and damage severity. Various types and levels of damage are illustrated with photographs. Reasons for damage, including the effect of grazing intensity and livestock management practices, are described. The future effects of grazing-induced damage, including potential form defects such as crook or sweep and the possibility of grazing wounds serving as inoculation points for pathogens, are also discussed.
Keywords: Range management/Grazing damage/Ponderosa pine/Southwestern United States/Historical document.

294. **Hitt, J. M. 1920**. A reference list of public documents, 1854-1918, found in the files of the state library. Unnumbered Report. Olympia, WA: State Librarian, State of Washington. 51 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This report provides a tentative reference list of early public documents for the State of Washington. It covers the period from the earliest Territorial days to 1918. This list only includes publications contained in the State Library; it was not possible to canvass other libraries to determine related publications in their holdings. The report is organized first by Department, followed by general topic headings that briefly describe the reports or other material available for that topic. So, it is necessary to know if documents on a certain topic may have been produced by more than one Department in order to obtain full coverage on that subject.
Keywords: Historical document/Washington history/Reference list.

295. **Hodson, E. R.; Foster, J. H. 1910**. Engelmann spruce in the Rocky Mountains, with special reference to growth, volume, and reproduction. Circular 170. Washington, DC: U.S. Department of Agriculture, Forest Service. 23 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This early circular covers the following topics as they pertain to Engelmann spruce forests in the Rocky Mountains: economic importance; distribution and local occurrence; silvical characteristics (moisture, light and soil requirements, root system, habit, growth, wood, dangers and diseases); reproduction, including the effect of fire; and management, including brush disposal and volume production.

Keywords: Engelmann spruce/Rocky Mountains/Silvics/Volume tables/Historical document.

296. **Hofmann, J. V. 1922**. The national forests of Oregon, Washington and Alaska. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 20 p. **Notes**: Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This paper was prepared for the Ecological Society of America, although there is no information about how, or whether, they used it. This document provides general information about the national forests of the Pacific Northwest, including Alaska, and describes the acreages involved in the national forest system, a general description of the major vegetation zones of the area (lower slope type, upper slope type, alpine type), and vegetation types associated with various ecoregions (Olympic Peninsula, Blue Mountains, etc.). Most of the report is a short description of each national forest (acreage, climate, accessability, vegetation types, etc.).
Keywords: Historical document/Pacific Northwest region/Oregon/Washington/Alaska/Blue Mountains/Umatilla NF.

297. **Hofmann, J. V. 1917**. Natural reproduction from seed stored in the forest floor. Journal of Agricultural Research. 11 (1): 1-26. **Notes**: A photocopy of an original.
Abstract: On many burns and cut-over areas in the Douglas-fir and western white pine regions of northwestern Idaho, Washington and Oregon, there are dense and irregular stands of young growth, the origin which can not be traced to the seed trees left after cutting or burning. The effort to find the true seed source for these stands began with a study to detemine the efficiency of seed trees in restocking the ground and the distances to which seed is disseminated. These facts led to a comprehensive study of large burns, particularly in the Douglas-fir region of Washington, and of cut-over lands in the Puget Sound area. The burns studied were divided into two classes: single burns, and repeat burns. The results of the 5-year study from 1912 to 1916 are based on surveys of burns comprising about 750,000 acres, and cut-over lands totalling 7,780 acres.
Keywords: Historical document/Coastal Douglas-fir/Seed storage/Natural regeneration/Western white pine.

298. **Hofmann, Julius V. 1924**. The natural regeneration of Douglas fir in the Pacific Northwest. Bulletin No. 1200. Washington, DC: U.S. Department of Agriculture. 62 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This comprehensive bulletin describes Douglas-fir forests of Oregon and Washington. Although it includes information about both varieties of Douglas-fir, most of the data pertains to the coastal variety. The following topics are discussed: distribution of Douglas-fir, climate and site characteristics, seed, origin of young growth, migration, character of second growth forests, competition, growth, silvicultural management, enemies, and botanical characteristics. Good photographs and maps are included in this publication.
Keywords: Douglas-fir/Pacific Northwest/Oregon/Washington/Natural regeneration/Historical document.

299. **Hopkins, A. D. 1909**. Practical information on the scolytid beetles of North American forests. Part I. Barkbeetles of the genus Dendroctonus. Bulletin No. 83, Part 1. Washington, DC: U.S. Department of Agriculture, Bureau of Entomology. 169 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This is one of a series of bulletins about the scolytid bark and wood boring beetles. Major topics discussed include: historical aspects; destruction caused by the beetles; possibilities of control; the beetle problem as compared to the fire problem; characteristics of the genus; favorable and unfavorable conditions for the beetles (climatic influences and other conditions such as fires, harvest, etc.); natural enemies of the beetles; general methods of control; and detailed information on the species. Includes information on many of our important species, including western pine beetle, mountain pine beetle, Douglas fir beetle, spruce beetle, and turpentine beetles. Includes good illustrations, line drawings of beetles, and range maps.
Keywords: Historical document/Bark beetles/Dendroctonus/Insect control/Insect damage/Insects/Mountain pine beetle/Western pine beetle/Douglas-fir beetle/Turpentine beetles/Spruce beetle.

300. **Hopkins, A. D. 1909**. Some insects injurious to forests. Part V. Insect depredations in North American forests and practical methods of prevention and control. Bulletin No. 58, Part 5. Washington, DC: U.S. Department of Agriculture, Bureau of Entomology. 114 p. **Size**: 6” x 9”. **Notes**: A photocopy of an original.
Abstract: This early bulletin describes some methods of prevention and control for important insects of North American forests. Major topics include: insect depredations in North American forests; interrelations of forest insects and forest fires; methods of prevention and control; utilization of natural enemies and factors in the control of injurious insects; utilization of waste caused by insects; how losses can be prevented; and a list of publications dealing with forest insects.
Keywords: Historical document/Bark beetles/Insect control/Insect damage/Insect prevention.

301. **Hopkins, A. D. 1910**. Summary, evidence, conclusions, and recommendations relating to insect depredations on the pine timber of northeastern Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Entomology. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report was based on correspondence, special investigations by agents of the Bureau of Entomology, Forest officials, and private owners of timber. It appeared from the evidence secured that isolated and small areas of dead and dying timber had been noticed by Forest officials and others in the Wallowa National Forest in 1905, and in the Whitman National Forest in 1906. After the Forest Service supplied the Bureau with information and insect specimens for identification, it was determined that the damage was caused by mountain pine beetle. In August of 1907, an agent of the Bureau, Mr. H. E. Burke, was instructed to make an investigation in the vicinity of Joseph, Oregon and then report, which he did. That report, in conjunction with information supplied by the Forest Service, indicated that insect depredations were so extensive, and facilities for utilizing the infested timber so poor, that it was not practical to initiate control work. The first information from the Whitman NF was supplied by a private land owner who stated that white pine was dying in T. 5 S., R. 38 E., section 6. The insect specimen that was submitted proved to be mountain pine beetle. In November of 1907, the Forest Supervisor of the Imnaha (Wallowa) NF reported that lodgepole pine was affected by an insect outbreak across the entire Forest, with 50% of some stands already killed by the beetle; that it was impossible to utilize the infested timber; and that he believed that yellow (ponderosa) pine would eventually be affected after all of the lodgepole pines had been killed. In March of 1909, the District Forester for District 6 requested all available information from the Bureau pertaining to control of bark beetles affecting pines, Douglas-fir, and Engelmann spruce; that information was provided to him. In January of 1910, private land owners adjacent to the Wallowa and Whitman NFs reported increasing beetle problems on their lands, and suggested that a cooperative control project be initiated involving them and the U. S. Department of Agriculture. Early in February of 1910, the District Forester offered the Forest Service's cooperation in a control project, and requested that an agent of the Bureau be located in District 6. In April of 1910, Hopkins prepared a proposed control plan and circulated it to the District Foresters of Districts 4 and 6, and to private landowners near the Wallowa and Whitman NFs. The essential features of that plan (referred to as Project 38) were approved by The Forester and the Chief of Silviculture in April, and by the private landowners via telegram in May. Agent Burke was then instructed to proceed to Baker City, Oregon to begin preliminary survey work. Mr. W. D. Edmonston (a Forest Ranger) was transferred from District 2 to District 6 to assist Mr. Burke. They both arrived in Baker City in mid May. In late May and early June, Ranger Smith and Forest Assistant Harvey of the Forest Service, who were detailed to work under Mr. Burke's instructions, began to acquire preliminary information as to the character and extent of the infestation on the two Forests. The project was directed by 6 individuals, two from the Bureau (Burke and Edmonston, who was initially paid by the Forest Service but was mostly paid as a special agent of the Bureau), two from the Forest Service (Smith and Harvey), and two from the private landowners (W. C. Calder, and Edward Gerber). Burke and Edmonston immediately initiated training exercises to teach the other parties how to recognize beetle-infested trees, beetle-abondoned trees, old beetle-killed trees, and how to cruise areas and identify principal infestation centers. Burke and Edmonston proceeded at once to study the insect and its infestation, while Smith and Harvey began preliminary surveys to identify the infested areas. Edmonston also assisted Calder with securing infestation information for private lands, and with Harvey on the Wallowa NF. By the time that survey information had been collected, it was so late in the season that beetles were beginning to emerge from infested trees and initiate new attacks. It was apparent by mid June that control work in areas with high-value yellow pine could have been initiated had sufficient men and money been available. Negotiations were begun at that point, but it eventually became apparent that neither labor nor funding would be forthcoming for that season. The author summarizes this report by stating "the information acquired places us in a position where we have a reliable and impregnable basis of facts on which to plan and conduct the campaign against the 1910-1911 invasion, with every prospect of complete success, provided the one essential requirement is met by the officials and individuals in charge of the Federal, State, and private interests, namely, **a properly organized and supported cooperative effort to adopt and carry out a definite policy according to the recommendations and advice of the Bureau of Entomology**" (emphasis present in the original).
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains.

302. **Horton, F. V. 1917**. Report on extensive grazing reconnaissance, Umatilla National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Umatilla National Forest]. Variable p. **Notes**: An original copy. A digital version of this report is available; filename: Umatilla3.
Abstract: This document reports the results of an extensive grazing reconnaissance of the Umatilla National Forest. The following individual sections are included in this document: Five-Mile cattle and horse division (10 p.); Lonerock cattle and horse division (4 p.); Hardman cattle and horse division (6 p.); Tamarack-Monument cattle and

horse division (15 p.); Cherry cattle and horse range (13 p.); Starkey cattle and horse division (11 p.); Camas and Hidaway cattle and horse range (11 p.); Madison cattle and horse range, Stanfield brothers sheep allotment, Smith and Barker sheep allotment (7 p.); and Black Mountain cattle and horse range (3 p.).
Keywords: Historical document/Umatilla NF/Range management/Blue Mountains/Cattle grazing/Sheep grazing/ Horse grazing.

303. **Hostetler, Bruce B. 1983**. Biological assessment of 1982 western spruce budworm suppression project: progress report #1. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Forest Pest Management. 16 p. **Notes**: A photocopy of an original.
Abstract: The first indication of an impending western spruce budworm outbreak was 2,300 acres of defoliation on the annual aerial detection survey in 1980. By the 1981 detection survey, the acreage of visible defoliation had increased to 310,000 acres, prompting Forest Pest Management, National Forest, and State personnel to initiate an environmental analysis of the situation. The analysis proposed that 208,000 acres of defoliated area on the Umatilla and Malheur National Forests receive direct treatment using insecticides. Due to budget constraints, only 178,549 acres of that total were actually treated in the spring of 1982. Acephate (Orthene Forest Spray) was used for areas adjacent to streams supporting spring Chinook salmon populations, whereas carbaryl (Sevin 4-oil) was used for the remainder of the areas. This report describes the results of the treatment projects on western spruce budworm populations. It contains the following sections: introduction; insecticide application; project area; sampling design and procedures (larval development, and larval population density); results (larval development and larval population density); discussion (larval development, and larval population density); acknowledgements; and references. The report includes 7 pages of maps (½" to the mile), showing the location of treatment units. Of the 6 treatment areas, three occurred wholly or partially on the Umatilla NF (Opal, Madison, and Middle Fork).
Keywords: Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Insect control/Chemical insecticides/Malheur NF/Carbaryl/Acephate.

304. **Hostetler, Bruce B. 1984?** Western spruce budworm egg mass and defoliation survey in the Blue Mountains of eastern Oregon, 1983. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Forest Pest Management. 16 p. **Notes**: A photocopy of an original.
Abstract: During the annual aerial forest insect detection survey conducted in August of 1983, western spruce budworm defoliation was detected on approximately 2.4 million acres in the Blue Mountains of northeastern Oregon and southeastern Washington. The defoliated area included about 525,000 acres that were treated with chemical or biological insecticides in 1983 (carbaryl, mexacarbate, and *Bacillus thuringiensis*), but still exhibited visible defoliation during the aerial survey in August of that same year. During August and September of 1983, crews visited areas in which defoliation was detected during the aerial survey to: verify presence or absence of budworm; make appropriate adjustments to defoliation boundaries; establish egg mass sample plots; and estimate levels of current (1983) defoliation as well as that of 1982 and 1981. The results of those field examinations are reported in this document. It contains the following sections: introduction; methods and materials; results and discussion; summary and recommendations; and reference. In addition, this report includes 5 tables and 5 maps, with the maps showing analysis unit identifications for each of the affected national forests (Malheur, Ochoco, Umatilla, and Wallowa-Whitman north half and south half).
Keywords: Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Insect control/Chemical insecticides/Malheur NF/Ochoco NF/Wallowa-Whitman NF/Carbaryl/Bacillus thuringiensis/Mexacarbate.

305. **Hostetler, Bruce B. 1983**. Western spruce budworm egg mass survey, eastern Oregon, 1982. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Forest Pest Management. 12 p. **Notes**: A photocopy of an original.
Abstract: During the annual aerial forest insect detection survey conducted in August of 1982, western spruce budworm defoliation was detected on approximately 1.5 million acres in the Blue Mountains of northeastern Oregon and southeastern Washington. The defoliated area included about 178,000 acres that were treated with chemical insecticides in 1982 (carbaryl and acephate), but still exhibited visible defoliation during the aerial survey in August of that same year. During August and September of 1982, crews visited areas in which defoliation was detected during the aerial survey to: verify presence or absence of budworm; make appropriate adjustments to defoliation boundaries; and establish egg mass sample plots. The results of those field examinations are reported in this document. It contains the following sections: introduction; methods and materials; results and discussion; recommendations; acknowledgements; and references. In addition, this report includes 1 table and 5 maps, with the maps showing analysis unit identifications for each of the affected national forests (Malheur, Ochoco, Umatilla, and Wallowa-Whitman north half and south half).
Keywords: Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Insect control/Chemical insecti-

cides/Malheur NF/Carbaryl/Acephate/Ochoco NF/Wallowa-Whitman NF.

306. **Hubbard, William F. 1904**. Forest thinning and its results. Forestry and Irrigation. (June/July): 268-271, 313-319. **Notes**: A photocopy of an original.
Abstract: This article was begun in the June issue, and completed in the July issue. It provides an interesting description of the history of thinning, noting that thinnings were being used in parts of Germany as early as the sixteenth century. By the latter half of the eighteenth century, they had become a common silvicultural practice throughout much of Europe. It was also noted that Hartig and other early German foresters were "intensely conservative" in their application of thinnings (in terms of the number of trees being removed) and, unfortunately, that same conservatism carried over into American forestry. The following topics are discussed: the theory and practice of thinnings in Europe; the technique of thinning; forest thinning in America; thinning a sapling stand; and thinning in pole stands.
Keywords: Forest management/Historical document/Thinning.

307. **Humphrey, R. R. 1943**. A history of range use and its relation to soil and water losses on the Walla Walla River watershed, Washington and Oregon. Northwest Science. 17: 82-87. **Notes**: A photocopy of an original.
Abstract: This interesting and informative article describes historical conditions on the Walla Walla River watershed. It contains the following sections: vegetation prior to white settlement; original grazing by game animals; introduction of horses; expansion of the livestock industry; development of dry-land wheat raising; effect of wheat raising on horse numbers; overgrazing and its effect on the plant cover; national forest areas; closure of Mill Creek watershed to grazing; effect of fires; and early floods and flood damage. A bibliography is also included.
Keywords: Historical document/Grazing/Horse grazing/Cattle grazing/Fire history/Sheep grazing/Umatilla NF/ Walla Walla River/Mill Creek/Floods/Presettlement vegetation.

308. **Hunt, George M. 1928**. The preservative treatment of farm timbers. Farmers' Bulletin No. 744. Washington, DC: U.S. Department of Agriculture. 34 p. **Size**: 6" x 9".
Notes: An original copy. Issued in September, 1916; this version is a revision dated December, 1928.
Abstract: Wood decays when in contact with the soil or in other damp places. The heartwood of some tree species is decay resistant and gives good service in damp situations without treatment. The sapwood of all species, and the heartwood of many, rot quickly in such environments unless treated with a preservative. Generally the proper use of a preservative will save money by greatly increasing the life of the wood. This bulletin was designed for all who are interested in prolonging the life of building timbers, poles, and posts, especially those on farms at great distances from the nearest wood-treating plants. It includes the following sections: introduction; decay; prolonging the life of posts without the use of preservatives; prolonging the life of posts by means of preservatives; prolonging the life of other forms of farm timbers; and cooperation.
Keywords: Historical document/Wood characteristics/Wood preservation.

309. **Ikenberry, Gilford J. 1934**. Progress in the investigation of the use of chemicals in the maintenance of Ponderosa Way. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 22 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a 4-page memorandum followed by 4 pages of photographs and a series of tables. The memo summarizes results of an investigation into the use of chemicals for the control of bear clover and weedy annuals, and for the prevention of sprouting from brush stumps on the fireline. This report describes progress in the investigation; a previous report dated December 29, 1933 also discussed the study and its results. Although it is not fully described in this progress report, it seems that the Ponderosa Way was a firebreak established in the chapparal zone of the Sierra Nevada foothills in central California (definitely in Placer County and Tuolumne County, perhaps others). There were three experimental areas established in this study: Columbia, Applegate, and North Fork. The following chemicals were applied at different rates and using different application methods: arsenic trioxide; sodium arsenite; sodium chlorate; and borax. In addition, a smaller experimental area of bear clover near Yankee Hill Camp was treated with different amounts of common salt. Dry chemicals were "sifted" onto the plots by hand, while chemicals in solution were applied with a "Super-Mist" sprayer. A chronic problem of the day was maintenance of firebreaks in the Sierra foothills in which stump sprouting, particularly by oaks, commonly occurred. To address that problem, a total of 350 stumps were treated in different ways and then marked with numbered tags in order to monitor their response. The majority of the stumps were treated with sodium arsenite in solution, applied in a cut extending through the bark and entirely around the base of the stump. In treated areas that were grazed by livestock, soil was thrown around the base of the stumps after application. Common salt was also applied in varying amounts to about 60 stumps to determine if that chemical could inhibit or prevent resprouting. Some stumps were treated with activated carbon bisulphide, although preliminary results indicated that it was not

an effective treatment. If efficacious chemical treatments could be found, the author believed that they would be much less expensive than another common stump treatment of that era – blasting them out with powder (dynamite). Ikenberry ends the memo with five recommendations for future work on the study: continue and extend the stump chemical investigations; develop definite cost figures that could be used to compare the various treatment alternatives; observations should continue to be collected throughout the growing season from the established plot areas; investigations should be made about the effect of brush clearing on the reproduction of manzanita and other chapparal species from seed; and it would be worth the effort to further study the vegetation of Southern California in order to better understand maintenance of the extensive firelines established near population centers.
Keywords: Brush clearing/Historical document/Sierra Nevada Mountains/Herbicides/Southern California/Ponderosa Way.

310. **Iler, J. C.; Beeman, W. H. 1938**. Analysis of Grande Ronde Working Circle, Umatilla National Forest, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Umatilla National Forest]. 13 p.
Notes: An original copy. A digital version of this report is available; filename: Umatilla4.
Abstract: This report describes the Grande Ronde Working Circle. It includes the following sections: introduction; physiographic features; forest description; economic situation; plan of action; and administrative correlation. Two tables are also included: volume by species in thousand board feet, and types in acres. A rough map showing the boundaries of the Wenatchee, Wenaha, and Elbow blocks, all of which are contained in the Grande Ronde Working Circle, is included.
Keywords: Historical document/Grande Ronde Working Circle/Umatilla NF/Blue Mountains/Forest management.

311. **Illick, Joseph S. 1935**. An outline of general forestry. New York, NY: Barnes & Noble, Inc. 259 p. **Size**: 6” x 8”.
Notes: An original copy.
Abstract: This book was designed primarily as a general introduction to forestry. It includes the following chapters: forestry and human welfare; what forestry is; what a forest is; trees of the forest; forest resources of the world; general forest situation in United States; development of the American lumber industry; exploitation and deterioration of forest resources; early growth of forestry; progress in federal forestry; progress in state forestry; county, municipal and private forestry; protection of forests against fire; forest enemies other than fire; the production and care of forests; building-up forest improvements and equipment; measuring and marketing forest products; the management of forests; the utilization of forest products; the structure and uses of wood; chemical utilization of wood; research in forestry; forest education; fields of employment and types of work in forestry; the life and work of a forester; work opportunities in forestry; forest administration; forestry in other countries; new federal conservation organization; and significant trends in forestry.
Keywords: Historical document/Forest policy/Forest management/Forestry education/Forest administration/Forest history/Forest economics.

312. **Irwin, J. F. 1929**. Cabin and corral on Penland Prairie. Photo Number 237521. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Penland Prairie. **Size**: 3½” x 5”. **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is attached to an 8” x 9” camera point study report form (Form R6-E13), although one copy is loose. This site is located between the Heppner and North Fork John Day Ranger Districts of the Umatilla National Forest. Information provided on the form includes these items: CPS # 16; date: 10/17/29; location: Penland Prairie; photo no. 1; light: fair; picture taken by: J. F. Irwin; description of scene, bringing out salient points of study which will make it of value for future reference – attach additional sheet if necessary: “Photograph #237521 taken Oct. 17, 1929 by J. F. Irwin. Cabin and corral on Penland Prairie.”
Keywords: Umatilla NF/Historical photograph/Heppner RD/North Fork John Day RD/Penland Prairie.

313. **Ise, John**. **1920**. The United States forest policy. New Haven, CT: Yale University Press. 395 p. **Size**: 6” x 9”.
Notes: An original copy.
Abstract: This book includes the following chapters: our forests prior to 1878; the period from 1878 to 1891; the forest reserves from 1891 to 1897; the forest reserves since 1897; forest reserves in the Appalachian and White Mountains; unreserved timber land since the passage of the forest reserve act; opposition to the general policy of forest reservations; criticism of the Forest Service; the work of the Forest Service; concentration in the ownership of standing timber; conditions in the lumber industry; and conclusions.
Keywords: Historical document/Forest policy/Forest reserves/Forest history/U.S. Forest Service history.

314. **Ives, Ronald L. 1946**. Botanical indicators of air drifts. Ecology. 27 (4): 364-369.

Notes: A photocopy of an original.
Abstract: This article describes changes in plant species distributions associated with strong diurnal air circulations that effect the temperature relationships of forest sites and create frost pockets and other temperature-related conditions. The following topics are discussed: introduction; vegetative factors; meteorological factors; topographic base; windless valley condition; deep drift condition; shallow drift conditions; shelter and viscosity effects; field conditions; and other regions. The author describes circumstances under which local air drifts are responsible for shifts in the altitudinal distribution of major life zones (montane, subalpine, etc.).
Keywords: Air drifts/Frost pockets/Mountain climate/Vegetational zonation/Historical document.

315. **Jackson, W. Turrentine**. **1949**. Federal road building grants for early Oregon. Oregon Historical Quarterly. 50 (March): 3-29. **Notes**: A photocopy of an original.
Abstract: This article describes early efforts to develop roads and other transportation improvements in the Oregon territory. It discusses the development of military roads in particular, with accounts of wagon roads also provided. With the exception of a minor discussion about the Dalles military road, most of the roads covered in this article were in western or southern Oregon.
Keywords: Access management/Historical document/Oregon/Oregon history.

316. **Jaenicke, A. J. 1948**. Miscellaneous memoranda regarding a proposal to control budworm in the vicinity of the Umatilla National Forest. Unpublished Typescript Memoranda. Portland, OR: U.S. Department of Agriculture, Forest Service. 4 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists primarily of a 3-page memorandum to the files that describes a proposal to complete an experimental control project against western spruce budworm on a mix of federal (U.S. Forest Service) and private lands near Heppner, Oregon. Aerial surveys in 1947 showed that almost 1,000,000 acres of mixed-conifer forest in eastern Oregon and Washington were infested with western spruce budworm. The bulk of the defoliated area was in the Blue Mountains of northeastern Oregon and southeastern Washington, with 710,000 acres. As of 1947, tree mortality was minimal, but it was believed that the outbreak was spreading and building, and that the worst of the damage was yet to come. Several experiments involving an insecticide called DDT were in progress against budworm in the northeastern United States and eastern Canada, and it was proposed to try DDT as a control agent against budworm in the Blue Mountains area. An area of 6,300 acres was delineated within a larger, 160,000-acre infestation affecting the Heppner Ranger District for an experimental application of DDT during the later half of June in 1948 (the defoliated area ranged from Swale Creek on the east to the Spray-Heppner highway on the west). The experimental area was located near Opal Butte and consisted of 15 plots of 1,260 acres each, with the treatments being: 1 pound DDT in 1 gallon of diesel oil per acre and applied by helicopter (3 plots); 1 pound DDT in 1 gallon of diesel oil per acre and applied by airplane (3 plots); 1 pound DDT in 1 gallon of diesel oil per acre and applied by airplane in two flights of 1/2 gallon per acre (3 plots); 2 pounds DDT in 2 gallons of diesel oil per acre and applied by helicopter (3 plots); and 3 untreated control plots. The State of Oregon contributed $5,000 to the project along with the Forest Service's allotment of $5,000. The total cost of the project was estimated to be $11,228, so the funding was actually a little short of what was needed for the project. If additional funding could not be found, Jaenicke recommended that the size of the plots be reduced somewhat, although that contingency should be avoided if at all possible. Note that the actual results of this proposal, which was modified somewhat from this proposal, are described in a Journal of Forestry article entitled "Airplane and helicopter spraying with DDT for spruce budworm control" and authored by C. B. Eaton and others (1949).
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Heppner RD/DDT/Kinzua Lumber Company.

317. **Jaenicke, Alexander J.; Foerster, Max H. 1915**. The influence of a western yellow pine forest on the accumulation and melting of snow. Monthly Weather Review. (March): 115-126.
Notes: A photocopy of an original.
Abstract: This article presents the results of a study conducted at Fort Valley Experiment Station, Arizona, during the winters of 1910-11 and 1912-13. The study involved 2 areas, alike in all respects, except that one was forested and the other naturally treeless. The following topics are discussed: the region; method and character of observations; meteorological record; comparison of snowfall in park and forest; comparison of melting in park and forest; moisture content of soil after disappearance of snow; conclusions; and remarks by the weather bureau. Some conclusions were: no appreciable difference in the snowfall on the forested and unforested areas; distribution of the snow on the ground differed greatly between the forested and unforested areas; the amount of snow retained by the tree crowns and lost to evaporation was small; snow melting rates in the winter were higher in the forest than the park; spring melting caused a rapid loss of the park's snow and most of it ran off, whereas forest melt rates were

much slower and most of the snowmelt was absorbed on site; forest soils retained the moisture better because the tree canopy protected it from wind and shaded it from sun, and because a layer of litter and duff on the soil surface reduced evaporative losses.
Keywords: Arizona/Forest influences/Historical document/Runoff/Water yield/Fort Valley Experiment Station/ Watershed management.

318. **Jardine, J. T.; Zon, R. 1912**. Reasons for retaining treeless areas at high altitudes within the national forests. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 10 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: An estimate made of different land classes within the national forests, exclusive of Alaska, showed that there was approximately 7,850,000 acres (about 5%) lying above the altitude of forest growth, or near the upper limit of the timber belt. Of that acreage, 4,265,000 acres was barren, consisting largely of unproductive rock; 1,500,000 acres was brush land; and 2,000,000 acres was grassland. The land of value for grazing was the brushland and grassland, together comprising no more than 2 percent of the total, national forest area. The high-altitude areas had an economic value for grazing and mining, but even more important was their watershed protection value against floods, erosion, landslides, and avalanches that threaten the valleys below. The protection value of alpine areas was considered to be more important than the grazing and mining value. Their importance for regulating stream flow and erosion was based on the following facts: precipitation was known to be greatest at high altitudes; the forest cover at high altitudes was very scrubby or non-existent; and the erosive force of water increases with altitude since it has a longer distance to travel before reaching the valleys below. It was widely known that treeless areas at high elevations were the source of devastating floods, not just in the United States but elsewhere. The authors describe a flood in Ephraim Canyon, Utah on July 28, 1912 that filled the town of Ephraim with mud and interrupted water and electric service for a week. Several prominent floods in the French Alps and elsewhere in Europe are also described. The areas above timberline are where avalanches originate. Statistics regarding avalanches in Switzerland (Swiss Alps) are provided. Landslides also originate in the higher elevations, where they can be caused by injudicious grazing and timber cutting. Once again, statistics and accounts of landslides in Europe are described. High altitudes were the source of most water in the western United States, so their protection was important for irrigation purposes. The treeless alpine belt and the forested subalpine zone found just below it were an integral unit in terms of protecting and regulating water flows. Since some people were recommending that the alpine areas be withdrawn from the national forest system because they were treeless, it was important to recognize their relationship to the forested areas below. In Europe, some countries were purchasing alpine areas in order to revegetate them and thereby control mountain torrents. The authors conclude by pointing out that the western United States had not yet suffered landslides, torrents, or other consequences resulting from mismanagement of high-elevation areas, but an important reason for that was that the areas had been reserved in the national forests and thereby protected from unregulated, uncontrolled grazing and mining.
Keywords: Ephraim Canyon/Erosion control/Grazing damage/Historical document/Alpine zone/Watershed protection/Western United States/Avalanches/Landslides/Mining damage.

319. **Jardine, James T. 1919**. Range management on the national forests. Bulletin No. 790. Washington, DC: U.S. Department of Agriculture. 98 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin provides an extensive and comprehensive picture of the range management situation on national forests in the early 1900s. A wide range of topics are covered, including the following items: determination of grazing stock suitability, grazing periods, grazing capacity, cattle management, sheep management, coordination of grazing with other resource management programs, range inspections, and management of poisonous and forage-producing plants. A bibliography of other publications about range management is also provided.
Keywords: Range management/Cattle grazing/Sheep grazing/Historical document.

320. **Johnson, F. A. 1955**. Volume tables for Pacific Northwest trees. Agriculture Handbook No. 92. Portland, OR : U.S. Department of Agriculture, Forest Service. 129 p. **Notes**: An original copy.
Abstract: This collection of volume tables has three purposes. One is to facilitate comparisons among tables, another is to release some unpublished tables for general use, and the third is to preserve certain tables for their reference value. Not all tables given here are necessarily recommended; a few would have been excluded if past use had not made them indispensable for re-examinations of old studies and surveys.
Keywords: Timber volume/Volume tables/Tree volume/Pacific Northwest/Historical document.

321. **Johnson, Floyd**. **1952**. Volume tables for lodgepole pine in Oregon and Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 32 p. **Size**: 6” x 9”. **Notes**: An original copy.

Abstract: Five sets of lodgepole pine volume tables are included in this paper. They are: set 1, Scribner board-foot tables based on merchantable height; set 2, International board-foot tables based on total height; set 3, Scribner board-foot tables based on total height; set 4, International board-foot tables based on total height; and set 5, cubic-foot tables based on total height. Each set consists of 10 tables with one table for each even-numbered form class between 56 and 74. The individual tables show volumes for trees of varying diameter and height.
Keywords: Historical document/Timber volume/Height growth/Tree volume/Lodgepole pine.

322. **Johnson, R. P. A.; Bradner, M. I. 1932**. Properties of western larch and their relation to uses of the wood. Technical Bulletin No. 285. Washington, DC: U.S. Department of Agriculture. 92 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: This comprehensive technical bulletin covers the following topics as they relate to western larch: character and range of western larch forests; merchandising practices; descriptive properties of western larch; how to distinguish western larch from other woods; mechanical and physical properties of larch wood; characteristic defects of larch wood; wood grades and their characteristics; wood grade descriptions; working stresses for dimension stock and timber; uses of western larch wood; and a short appendix.
Keywords: Western larch/Wood characteristics/Inland Empire/Historical document.

323. **Johnson, R. P. A.; Davis, E. M. 1939**. Use and abuse of wood in house construction. Miscellaneous Publication No. 358. Washington, DC: U.S. Department of Agriculture, Forest Service. 24 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: To find where guidance in the use of wood in home construction is particularly needed, the Forest Products Laboratory inspected 600 homes under construction in 20 communities in northern, southern, and eastern states. This publication deals principally with those construction features that the inspection showed were most likely to be misunderstood or neglected. It includes the following sections: introduction; foundations; in the basement; the skeleton frame; nails; around the openings; braces; cutaways; rains during building; moisture within the wood; seeping moisture; drainage outlets and ventilation; roofing material; roof protection; and quality lumber.
Keywords: Historical document/Home construction/Wood utilization.

324. **Jones, Forrest W.; Welch, Dehn S.; Usher, Jack H. 1961**. Forest inventory statistics for the Umatilla National Forest, North Umatilla Working Circle and South Umatilla Working Circle. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6, Division of Timber Management. 132 p.
Notes: An original copy.
Abstract: This report describes the results of a forest survey conducted on the Umatilla National Forest during the 1958 field season. It reflects the Forest's timber resource status as of January 1, 1959. The document includes the following information: introduction; summary of forest statistics North Umatilla and South Umatilla Working Circles (summary of resource – grand totals); working circle statistics North Umatilla working circle (summary of resource, net volume and periodic annual growth by type, area distribution by type, volume and acreages by type, area and volume by species by broad forest type, volume by species by merchantability class, volume and growth of trees within broad forest types in relation to rotation age, growth and mortality by species, periodic net growth and net volume of merchantable trees by specific forest type, total volume and total area by stand age class and broad forest type, empirical yield table curve, total volume and total area by site index, distribution of area by slope classification, average annual precipitation, and stand table curves); District statistics North Umatilla Working Circle (subplot distribution, volume and area by Ranger District); county statistics North Umatilla Working Circle (net volume and area by type, summary of acreages and volume, net volume of live sawtimber on commercial forest land by species, growth and mortality by species); special items used in computation North Umatilla Working Circle (local volume table curves, 16 foot form class and cull and breakage factors used in developing the inventory, bark correction factor used for gross growth computation); working circle statistics South Umatilla Working Circle (summary of resource, net volume and periodic annual growth by type, area distribution by type, volume and acreages by type, area and volume by species by broad forest type, volume by species by merchantability class, volume and growth of trees within broad forest types in relation to rotation age, growth and mortality by species, periodic net growth and net volume of merchantable trees by specific forest type, total volume and total area by stand age class and broad forest type, empirical yield table curve, total volume and total area by site index, distribution of area by slope classification, average annual precipitation, and stand table curves); District statistics South Umatilla Working Circle (summary of volume and area by Ranger District, volume and area by Ranger District, volume by species by Ranger District); county statistics South Umatilla Working Circle (net volume and area by type, net volume of live sawtimber on commercial forest land by species); special items used in computation South Umatilla Working Circle (local volume table curves, 16 foot form class and cull and breakage factors used in developing the inventory, bark correction factor used for gross growth computation); and miscellaneous (explanation of terms

used, notes and explanation of procedure, plot location map). The front of this particular copy includes a photocopy of a four-page memorandum from Wright T. Mallery (Forest Supervisor) to the District Rangers of the Pomeroy and Walla Walla Ranger Districts. It is dated January 11, 1963 and describes the allowable timber cut calculation for the Pendleton, Pomeroy, and Walla Walla Ranger Districts based on a proposed boundary change between the Walla Walla and Pomeroy Districts.
Keywords: Forest inventory/Historical document/Umatilla NF/Forest types/Timber management/Timber surveys/ Timber volume/Pendleton RD/Pomeroy RD/Walla Walla RD.

325. **Jorgensen; Cary**. **1941**. Active sheet and gully erosion on the north side of Mill Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Mill Creek near Paradise Ridge. **Size**: 3" x 4".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 25, 1941. Location: A ridge on north side of Mill Creek. Lies opposite canyon from Paradise Ridge. Picture: Shows accelerated sheet and gully erosion still active.
Keywords: Watershed management/Umatilla NF/Grazing damage/Historical photograph/Walla Walla RD/Walla Walla watershed/Mill Creek/Soil erosion/Paradise Ridge.

326. **Jorgensen; Cary**. **1941**. Forage conditions near the Rodgers Ridge experimental plot. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: South Fork Walla Walla River. **Size**: 2½" x 3½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 2, 1941. Location: 25 yds. below Rodgers Ridge Exp. Plot, located above Bear Cr. G. S., S. Fork Walla Walla River. Picture: View of outside range in comparison to Rodgers Ridge Exp. Plot. Density – .35; Grasses 55%, P 4%, A 51%; Weeds 45%, P 27%, A 18%. Grasses: Bromus tectorum 44%, festuca annual 6%, poa pratensis 3%, agropyron spicatum 1%, bromus commutatus 1%. Weeds: Lupine-G 16%, erodium cicutarium 18%, achillea lanulosa 7%, agoseris 2%, leontodon taraxacum 2%, lathyrus T.
Keywords: Watershed management/Umatilla NF/Grazing damage/Historical photograph/Walla Walla RD/Walla Walla watershed/South Fork Walla Walla River/Rodgers Ridge experimental plot.

327. **Jorgensen; Cary**. **1941**. Forage conditions within the Rodgers Ridge experimental plot [#1]. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: South Fork Walla Walla River. **Size**: 2½" x 3½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 2, 1941. Location: Rodgers Ridge Exp. Plot, above Bear Cr. G. S., S. Fork Walla Walla River. Picture: Forage within the plot; established 1930. Density – .45. Grasses 50%, P 41%, A 9%; Weeds 15%, P 15%, A 0; Shrubs 35%, P 35%, A 0. Grasses: Agropyron spicatum 30%, poa pratensis 8%, bromus carinatus 3%, bromus tectorum 7%, bromus brizaeformis 2%. Weeds: Lathyrus 1%, lupine T, achillea 2%, agoseris T, drymocallis T, synthyris T, aster 11%, tragopogon T, galium, T, leontodon T, gilia T, calochortus T, lithophragma T, collinsia T. Shrubs: Symphoricarpos 33%, spiraea 1%, rose 1%.
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/South Fork Walla Walla

River/Forbs/Grasses/Forage production/Rodgers Ridge experimental plot.

328. **Jorgensen; Cary**. **1941**. Forage conditions within the Rodgers Ridge experimental plot [#2]. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: South Fork Walla Walla River. **Size**: 2½" x 3½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 2, 1941. Location: Rodgers Ridge Exp. Plot. Picture: See other picture for details of plant cover (refers to other picture of May 2, 1941 regarding Rodgers Ridge plot).
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/South Fork Walla Walla River/Forbs/Grasses/Forage production/Rodgers Ridge experimental plot.

329. **Jorgensen; Cary**. **1941**. North side of Mill Creek opposite Paradise Ridge. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Mill Creek. **Size**: 3" x 4". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 25, 1941. Location: North side of Mill Creek opposite Paradise Ridge. Picture: Note pure stand of Bromus tectorum and grazed browse plants of serviceberry, ceanothus, rosa, etc.
Keywords: Watershed management/Umatilla NF/Grazing damage/Historical photograph/Walla Walla RD/Walla Walla watershed/Mill Creek.

330. **Jorgensen; Cary**. **1941**. Overgrazed browse plants on the north side of Mill Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Mill Creek near Paradise Ridge. **Size**: 3" x 4".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 25, 1941. Location: North side of Mill Creek on ridge opposite Paradise Ridge. Picture: Overgrazed browse: serviceberry, ceanothus, rosa, snowberry, oceanspray, fir tree. Note dead serviceberry.
Keywords: Watershed management/Umatilla NF/Grazing damage/Historical photograph/Walla Walla RD/Walla Walla watershed/Mill Creek/Paradise Ridge/Grazing damage/Shrubs/Browse/Big game.

331. **Jorgensen; Cary**. **1941**. Overgrazed elderberry by deer and elk. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: North side of Mill Creek. **Size**: 3½" x 6". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: March 12, 1941. Location: North side of Mill Cr. on ridge west of Deadman Cr. and leading up to Green Peak ½ mi. above Mill Cr. See aerial photo BTU-81-26. Picture: Overgrazed elderberry

(Sambucus) by deer and elk.
Keywords: Watershed management/Umatilla NF/Historical photograph/Big game/Elk/Grazing damage/Walla Walla RD/Deer/Walla Walla watershed/Mill Creek.

332. **Jorgensen; Cary**. **1941**. Overgrazed range adjacent to Patit Creek experimental plot. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 21, T. 10 N., R. 40 E., north side of road. **Size**: 2½" x 3½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: April 30, 1941. Location: Adjacent range to Patit Creek Exp. Plot, Sec. 21, T. 10 N., R. 40 E., north side of road. Picture: Shows condition of overgrazed range in comparison to exclosure.
Keywords: Watershed management/Grazing damage/Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/Patit Creek experimental plot.

333. **Jorgensen; Cary**. **1941**. Overgrazed snowbrush ceanothus by deer and elk. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Walla Walla watershed. **Size**: 3½" x 6".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: March 12, 1941. Location: ¾ mi. up north side Mill Creek, on first ridge west of Deadman Creek, leading up to Green Peak. See aerial photo BTU-81-26. Picture: Overgrazed *Ceanothus velutinus* by deer and elk.
Keywords: Watershed management/Umatilla NF/Historical photograph/Big game/Elk/Grazing damage/Walla Walla RD/Deer/Walla Walla watershed.

334. **Jorgensen; Cary**. **1941**. Overgrazed winter game range. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: South Fork Walla Walla River. **Size**: 2½" x 3½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 2, 1941. Location: About 1 mi. downstream from Bear Creek G. S., South Fork Walla Walla River. Picture: Shows overgrazed winter game range. Plants grazed: Hawthorn, ocean spray, mock orange, snowberry.
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/Big game/Grazing damage/Winter range/South Fork Walla Walla River.

335. **Jorgensen; Cary**. **1941**. Overgrazed winter range in vicinity of Elbow Creek. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: South Fork Walla Walla River. **Size**: 2½" x 3½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating

some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: May 2, 1941. Location: In vicinity of mouth of Elbow Creek on S. Fork Walla Walla River. Picture: Shows overgrazed winter game range. Plants grazed: Hawthorn, Ocean Spray, Mock Orange, Fir seedlings.
Keywords: Watershed management/Grazing damage/Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/South Fork Walla Walla River/Winter range/Big game.

336. **Jorgensen; Cary**. **1941**. Patit Creek experimental plot in 1941 [#1]. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 21, T. 10 N., R. 40 E., north side of road. **Size**: 3" x 4".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: April 30, 1941. Location: Patit Creek Exp. Plot, Sec. 21, T. 10 N., R. 40 E., north side of road. Picture: Plot established 1938. Density - .30, Grasses 70%, P 67%, A 3%. Weeds 30%, P 29%, A 1%. Grasses: Agropyron spicatum, poa secuda, bromous tectorum. Weeds: Balsamorhiza sagittata, balsamhoriza [sic] hookeri, cogswellia, lupine, collinsia, draba, quamasia, cryptantha, astragalus, hookera, crepis.
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/Patit Creek experimental plot/Forbs/Grasses.

337. **Jorgensen; Cary**. **1941**. Patit Creek experimental plot in 1941 [#2]. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Patit Creek Exp. Plot, Sec. 21, T. 10 N., R. 40 E., north side of road. **Size**: 3" x 4". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: April 30, 1941. Location: Patit Creek Exp. Plot, Sec. 21, T. 10 N., R. 40 E., north side of road. Picture: Plot closed in 1940. Density - .20, Grasses 40%, P 10%, A 30%. Weeds 60%, P 57%, A 3%. Grasses: Agropyron spicatum, poa secunda, bromus tectorum. Weeds: Balsamorhiza saggitata, balsamorhiza hookeri, cogswellia, lupine, fritillaria, collinsia, draba, quamasia, cryptantha, astragalus, hookera, achillea, crepis.
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/Patit Creek experimental plot/Forbs/Grasses.

338. **Jorgensen; Cary**. **1941**. Patit Creek experimental plot in 1941 [#3]. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 21, T. 10 N., R. 40 E., north side of road. **Size**: 2½" x 3½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included with a memorandum (file designation G, Management – Umatilla, Surveys), dated August 12, 1941 and addressed to the Regional Forester in Portland, Oregon, relating to conditions on the Walla Walla Watershed. There were 14 black-and-white photographs of various sizes enclosed with the memorandum. Text of the memorandum is: "Enclosed herewith are several photographs take by Jorgensen and Cary illustrating some of the conditions on the Walla Walla Watershed. These are forwarded to you as a matter of interest in connection with this project." The memorandum was signed by John G. Clouston, acting for Forest Supervisor Carl Ewing. Date of this photograph: April 30, 1941. Location: Patit Cr. Exp. Plot, Sec. 21, T. 10 N., R. 40 E., north side of road. Picture: Plot established 1936. Density – .35; Grasses 55%, P 50%, A 5%; Weeds 45%, P 43%, A 2%. Grasses: Agropyron spicatum, poa secunda, bromus tectorum. Weeds: Plectritus, balsamorhiza sagitatta, balsamorhiza hookeri, cogswellia, lupine, fritillaria, collinsia, draba, quamasia, agoseris, cryptantha, astragalus, hookera, achillea, crepis.
Keywords: Umatilla NF/Historical photograph/Walla Walla RD/Walla Walla watershed/Patit Creek experimental

plot/Forbs/Grasses.

339. **Jorgensen, C. G. 1970**. Aerial spraying projects. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6. 4 p. **Notes**: An original copy.
Abstract: This accession consists of a one-page memorandum (5240 file designation), two tables, and a ¼" to the mile colored map showing aerial spray projects completed in Oregon and Washington. The memorandum is a short one that serves as a transmittal for the tables and map. Table 1 is entitled "Aerial spraying and dusting projects in Oregon and Washington, 1931-1965" and provides the following information: year; insect species controlled; state; area sprayed (private, state, federal); total area; insecticide used; rate of application; and mortality (average, range). Table 2 is entitled "Experimental aerial spraying in Oregon and Washington, 1948-1969" and provides the same type of information as Table 1. The map is dated 1970 and entitled "Forest insect aerial spray projects in Oregon and Washington." It shows 9 spruce budworm control projects (1949-1962), 2 Douglas-fir tussock moth projects (1947 and 1965), and 6 hemlock looper dusting projects (1931-1969). Treatment areas are shown in color on the map, either in a solid (filled) or cross-hatched fashion.
Keywords: Aerial spraying/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/Western spruce budworm/Hemlock looper/Chemical insecticides/DDT/Bacillus thuringiensis/Zectran.

340. **Jorgensen, C. G. 1970**. Forest inventory statistics for the Malheur National Forest, Malheur Working Circle. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6, Division of Timber Management, Branch of Plans and Silviculture. 67 p. **Notes**: An original copy.
Abstract: This report describes the results of a forest survey conducted on the Malheur National Forest during the 1967 field season. It reflects the Forest's timber resource situation as of January 1, 1968. The document includes the following information: introduction (geographic location, date of survey, functions of forest inventories, land classification); map of Region 6 working circles; summary of resources; and a series of tables: board foot volume and area by stand size and forest type (5 tables), cubic foot volume and area by stand size and forest type (5 tables), board foot and cubic foot volumes by merchantability class by species (7 tables); board foot periodic annual growth and mortality by species, cubic foot periodic annual growth and mortality by species, board foot periodic annual growth and mortality by forest type, cubic foot periodic annual growth and mortality by forest type, board foot and cubic foot volume and area by age class (7 tables), area in acres by site index and forest type group, slope percent distribution by forest type group (5 tables), number (hundreds) of growing stock trees by species and diameter classes (7 tables), board foot volume by species and diameter classes (7 tables), and cubic foot volume by species and diameter classes (7 tables). In addition, this document contains a 3-page appendix having the following sections: field procedures; office procedures (volume estimates, growth estimates, reliability of the estimates); forest type groupings defined; and glossary of terms.
Keywords: Forest inventory/Historical document/Forest types/Timber management/Timber surveys/Timber volume/Malheur NF/Malheur Working Circle.

341. **Jorgensen, C. G. 1970**. Forest inventory statistics for the Umatilla National Forest, Umatilla Working Circle. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6, Division of Timber Management, Branch of Plans and Silviculture. 74 p. **Notes**: An original copy.
Abstract: This report describes the results of a forest survey conducted on the Umatilla National Forest during the 1968 and 1969 field seasons. It reflects the Forest's timber resource status as of January 1, 1970. The document includes the following information: introduction (geographic location, date of survey, functions of forest inventory, land classification); map of Region 6 working circles; summary of resources; and a series of tables: board foot volume and area by stand size and forest type (7 tables), cubic foot volume and area by stand size and forest type (7 tables), board foot and cubic foot volumes by merchantability class by species (7 tables); board foot periodic annual growth and mortality by species, cubic foot periodic annual growth and mortality by species, board foot periodic annual growth and mortality by forest type, cubic foot periodic annual growth and mortality by forest type, board foot and cubic foot volume and area by age class (7 tables), area in acres by site index and forest type group, slope percent class distribution by forest type group (7 tables), number (hundreds) of growing stock trees by species and diameter class (7 tables), board foot volume by species and diameter classes (7 tables), and cubic foot volume by species and diameter classes (7 tables). In addition, this document contains a 3-page appendix having the following sections: field procedures; office procedures (volume estimates, growth estimates, reliability of the estimates); forest type groupings defined; and glossary of terms.
Keywords: Forest inventory/Historical document/Umatilla NF/Forest types/Timber management/Timber surveys/Timber volume/Umatilla Working Circle.

342. **Jorgensen, C. G. 1970**. Forest inventory statistics for the Wallowa-Whitman National Forest, Wallowa-Whitman

Working Circle. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6, Division of Timber Management, Branch of Plans and Silviculture. 75 p. **Notes**: An original copy.
Abstract: This report describes the results of a forest survey conducted on the Wallowa-Whitman National Forest during the 1966 and 1967 field seasons. It reflects the Forest's timber resource situation as of January 1, 1968. The document includes the following information: introduction (geographic location, date of survey, functions of forest inventories, land classification); map of Region 6 working circles; summary of resources; and a series of tables: board foot volume and area by stand size and forest type (9 tables), cubic foot volume and area by stand size and forest type (9 tables), board foot and cubic foot volumes by merchantability class by species (5 tables); board foot periodic annual growth and mortality by species, cubic foot periodic annual growth and mortality by species, board foot periodic annual growth and mortality by forest type, cubic foot periodic annual growth and mortality by forest type, board foot and cubic foot volume and area by age class (6 tables), area in acres by site index and forest type group, slope percent class distribution by forest type group (9 tables), number (hundreds) of growing stock trees by species and diameter classes (6 tables), board foot volume by species and diameter classes (6 tables), and cubic foot volume by species and diameter classes (6 tables). In addition, this document contains a 3-page appendix having the following sections: field procedures; office procedures (volume estimates, growth estimates, reliability of the estimates); forest type groupings defined; and glossary of terms.
Keywords: Forest inventory/Historical document/Forest types/Timber management/Timber surveys/Timber volume/Wallowa-Whitman NF/Wallowa-Whitman Working Circle.

343. **Jorgensen, C. G. 1973**. Monongahela lawsuit – Izaak Walton League et al. v. Butz et al. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6. 28 p.
Notes: A photocopy of an original.
Abstract: The Izaak Walton League and other plaintiffs sued the Forest Service, claiming that the plain language in the Organic Act of June 4, 1897 had limited the sale of timber from the National Forests to nothing other than dead, physiologically mature and large-growth trees. The plaintiffs also argued that each tree sold must be individually marked and designated and must be cut and completely removed. In other words, the lawsuit challenged the basic authority under which National Forest timber was sold. The plaintiffs were attempting to stop clearcutting on the Monongahela National Forest in West Virginia. On November 6, 1973, the Federal District Court in Elkins, West Virginia issued a decision in favor of the plaintiffs in the lawsuit. This accession includes the following items: a November 30, 1973 memorandum from C. G. Jorgensen to the Forest Supervisors of Region 6; a November 14, 1973 memorandum from R. E. Worthington, Director of Timber Management for the Forest Service, to the Regional Foresters; a November 12, 1973 memorandum from John R. McGuire, Chief of the Forest Service, to the Secretary of Agriculture; and a copy of the November 6, 1973 opinion of the District Court (25 pages). This item is interesting because it describes one of the events that eventually led to new legislation governing Forest Service activities – the National Forest Management Act of 1976.
Keywords: Forest history/Forest policy/Clearcutting/National Forest Management Act.

344. **Jorgensen, Glen**. **1948**. Timber disposal plan: Elgin Block, La Grande Working Circle. Unpublished Typescript Report. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 11 p.
Notes: An original copy. A digital version of this report is available; filename: Umatilla6.
Abstract: This short report includes the following sections: introduction; management objectives; analysis of national forest resources; calculation of allowable annual cut; and sale program. Tables providing timber volumes and forest type acreages are also included in this document.
Keywords: Historical document/Elgin Block/La Grande Working Circle/Umatilla NF/Blue Mountains/Forest management/Timber management/Timber management plan/Timber volume/Timber yields.

345. **Jorgensen, Glen**. **1948**. Timber disposal plan: Pendleton-Pilot Rock Working Circle. Unpublished Typescript Report. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 29 p.
Notes: An original copy. A digital version of this report is available; filename: Umatilla5.
Abstract: This report includes the following sections: introduction; management objectives; analysis of national forest resources; calculation of allowable annual cut; and sale program. It includes many tables summarizing timber volumes and forest type acreages. The Pendleton-Pilot Rock Working Circle included the following blocks: Gibbon, McKay, Pilot Rock, Gurdane, Ukiah, Camas, Desolation, and North Fork.
Keywords: Historical document/Pendleton-Pilot Rock Working Circle/Umatilla NF/Blue Mountains/Forest management/Timber management/Timber management plan/Timber volume/Timber yields.

346. **Judd, C. S. 1911**. Lectures on timber sales. Unpublished Typescript Paper. [Portland, OR]: U.S. Department of Agriculture, Forest Service, North Pacific District. 90 p. **Notes**: An original copy.

Abstract: This accession consists of the remarks delivered during a series of lectures at the University of Washington between February 27, 1911 and March 4, 1911. It provides a comprehensive picture of the early timber sale program on national forest lands of the Pacific Northwest. The following topics are included: what the government has in the way of standing timber on the national forests; past history of Forest Service and how much timber has been cut; object of selling national forest timber and how this object is attained; general policy of selling national forest timber; general kinds of timber sales; present regulation of the annual cut; the law governing timber sales; introduction to timber sale procedure; delegation of authority to make timber sales; classes of sales; payment for timber; how timber sale payments are handled; refunds; general procedure in Class A sales; general procedure in Class B unadvertised sales; general procedure in Supervisor's advertised Class B sales; general procedure in Class C sales; timber advertisements – how prepared and published; advance cutting; stumpage prices; time allowed on timber sale contracts; special points to be taken into consideration in making timber sale examinations; examination of timber and method of cutting; form of timber sale report; timber sale maps; timber estimate; special regulations in timber sale contracts; scaling; cutting reports; monthly report by Supervisor of timber cut and sold; form of timber sale application and final contract; points for Supervisors to check up in the field; timber sale bonds; modification of timber sale contract; execution of contracts and bonds and evidence of authority; timber settlement; free use; timber trespass; fire trespass; sawmill permit and bond; and conclusion.
Keywords: Forest history/Pacific Northwest/Timber sales/Timber harvesting/Historical document.

347. **Kavanagh, E. N. 1922**. Common names (and botanical names) for principal District 6 plant species. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 40 p.
Notes: An original copy, printed double-sided.
Abstract: This document is an alphabetically arranged list of common and botanical plant names for the main genera and species that occur in District (Region) 6. It was prepared to simplify the use of common names for range plants. The list was designed to serve as a standard guide for common names in connection with all plant collection and identification work related to grazing in the District. It was made to be bound in permanent form so that it could be used continuously for reference work by all Forest officers in the field. The list was organized into four groups as was standard practice for grazing work: grasses, grasslike plants, non-grasslike plants, and trees and shrubs. The section on trees and shrubs does not include conifers (either shrubs or trees). In addition to the four groups, a list of the principal poisonous plants with brief descriptions is also provided. In both the index and the botanical list, extra space was provided for the addition of new plants. As new plants were encountered in the field, officers were encouraged to submit them to the District Office for possible inclusion in updates or new versions of the list. For each genus and species, only one common name was listed, since one objective of the list was to standardize the use of common names in the District. It was recommended that the list be stored in No. 406 cardboard binders so that it could be carried and used in the field; often, the list was included in the same binder as the range appraisal vegetative type photographic sets (see USDA Forest Service 1921 in the history archives for a copy of that document). All future official grazing records and correspondence that used the common names of plants, exclusive of conifers, was expected to conform to the common names provided in this list.
Keywords: Botany/Historical document/Poisonous plants/Range management/Reference list/Pacific Northwest Region.

348. **Kearney, T. H.; Briggs, L. J.; Shantz, H. L.; McLane, J. W.; Piemeisel, R. L. 1914** . Indicator significance of vegetation in Tooele Valley, Utah. Journal of Agricultural Research. 1 (5): 365-417.
Notes: A photocopy of an original.
Abstract: This article reports the results of research first initiated in the Great Plains: correlation of vegetation types with land and soil characteristics. The objectives of this study were to: determine which vegetation types in the Great Basin are related to soil moisture conditions favorable or unfavorable to dry land farming, and which vegetation types indicate the presence or absence of alkali salts in quantities likely to injure crops. The following topics are discussed: methods of research; climate of Tooele Valley; geology and topography of Tooele Valley; saline conditions of Tooele Valley; vegetation of Tooele Valley; and summary. A correlation is eventually established between vegetation types (sagebruch, kochia, shadscale, greasewood, etc.) and soil moisture and salinity.
Keywords: Agriculture/Great Basin/Historical document/Utah/Vegetation classification/Tooele Valley.

349. **Keen, F. P. 1937**. Climatic cycles in eastern Oregon as indicated by tree rings. Monthly Weather Review. 65 (5): 175-188. **Notes**: A photocopy of an original.
Abstract: This interesting article describes the results of an early study to estimate prehistoric climatic cycles by interpretation of tree rings. The following topics are discussed: early work on climate and tree growth; study methods; tree growth patterns; correlation of tree growth with precipitation; the tree-ring calendar; growth cycles; and a summary. The author was able to derive an index of climatic history back to the year 1268 by interpreting tree

rings.
Keywords: Eastern Oregon/Climate/Growth rings/Historical document.

350. **Keen, F. P. 1950**. The influence of insects on ponderosa pine silviculture. Journal of Forestry. 48: 186-188.
Notes: A photocopy of an original.
Abstract: The silvics of any forest type are determined by the interaction of climatic, edaphic, and environmental factors on the tree species involved. This "law" was well recognized by most foresters, but Keen wondered how often it was recognized that insects may be the dominant environmental factor determining the silvics of a forest type. He then described how bark beetles were nature's principal silvical agent in regulating, thinning, and harvesting ponderosa pine stands before the advent of anthropogenic management based on European precedents. What impressed Keen was that the "silvicultural" process applied by the beetles was often indicative of the best natural silvicultural system that could be used with the ponderosa pine type. He then observed that there were several different species of bark beetle operating across the wide geographical range of ponderosa pine, and that there appeared to be at least two races or forms of the species in that same area (the Pacific Coast form, and the Rocky Mountain form). The article then goes on to describe the ecological or silvical effects of various bark beetle species in the ponderosa pine forests of the western United States. It has the following sections: mountain pine beetle; western pine beetle; Black Hills beetle; other insects; and literature cited. Keen ends with this quote from Solomon: "go to the ant, thou sluggard; consider her ways, and be wise," which he translated into this advice for the silviculturist – study the insects, and learn of their ways.
Keywords: Historical document/Ponderosa pine/Bark beetles/Insect susceptibility/Mountain pine beetle/Western pine beetle.

351. **Keen, F. P. 1952**. Insect enemies of western forests. Miscellaneous Publication No. 273. Washington, DC: U.S. Department of Agriculture, Forest Service. 280 p. **Size**: 6" x 9".
Notes: An original copy. This publication is a revision of the original issued in February, 1938.
Abstract: This manual has been prepared to meet the needs of forest rangers, field men, and others entrusted with the protection of forest resources, the prevention of insect damage to timber crops, and the control of forest insect outbreaks. Its coverage is restricted to insects found in forests west of the Great Plains, roughly the 100th meridian
Keywords: Insect damage/Western United States/Insects/Bark beetles/Douglas-fir beetle/Douglas-fir pitch moth/ Fir engraver/Historical document/Insect control/Insects/Mountain pine beetle/Pandora moth/Spruce beetle/Turpentine beetles/Western pine beetle/Western spruce budworm.

352. **Keen, F. P. 1940**. Ponderosa pine tree classes redefined. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 36 p.
Notes: An original copy.
Abstract: After a tree classification was developed by Keen in the mid 1930s to help determine relative susceptibility of ponderosa pine trees to bark-beetle attack (see Keen's article from the Journal of Forestry, 1936, for more information about the system itself), it quickly became popular and was widely used in the ponderosa pine region of eastern Oregon and Washington. Variants of his system were also developed for the Black Hills of South Dakota and Wyoming (by Hornibrook) and the southwestern United States (by Thomson). As the system came into general use, it was necessary to develop more exact definitions for the tree classes than were originally proposed. This document provides the additional detail and specificity that was lacking in the original definitions. It includes a slide-rule calculator that would help users determine both age class and crown class for ponderosa pine stands growing on class IV lands in the region. In addition, 15 high-quality black-and-white photographs are included at the end of this report to pictorially illustrate the tree classes.
Keywords: Historical document/Keen classification system/Ponderosa pine/Eastern Oregon/Bark beetles/Insect susceptibility.

353. **Keen, F. P. 1936**. Relative susceptibility of ponderosa pines to bark-beetle attack. Journal of Forestry. 34: 919-927. **Notes**: A photocopy of an original.
Abstract: Heavy killing of ponderosa pine in the Pacific Northwest from attacks by western pine beetle, particularly in the early and mid 1930s, raised concerns about how to control or eliminate such losses. Both from the immediate viewpoint of timber salvage and from the forestry objective of a satisfactory silvicultural situation, one of the first requirements in solving the pine beetle problem was to determine what type of tree presents the greatest risk of beetle attack. Once that type of tree was recognized, it was possible to make partial cuttings to remove beetle-susceptible trees, either in anticipation of salvage or to reduce the risk of future mortality from bark beetles. During the previous decade, silviculturists and entomologists had extensively studied the relative susceptibility of different types of ponderosa pine to pine-beetle attack. The studies revealed that the risk of being killed by western pine bee-

tles was significantly greater for trees of certain types than it was for other trees in the same stand. In general, the trees most susceptible to attack were the weaker, less vigorous individuals and, to a certain degree, the oldest pines. A "bark-beetle susceptibility classification" was eventually developed after extensive field study. It was initially based on the Dunning tree-vigor classification system developed for northern California. However, it was soon noticed that marked differences in bark-beetle susceptibility existed within some of the Dunning tree classes and, in some cases, the differences within a Dunning class might be greater than differences between classes. So, it was decided to develop a more detailed classification consisting of a larger number of small, homogenous, easily-recognized tree types that could be readily used in the field. The new classification was based to a large extent upon the same considerations of age, dominance, and vigor that Dunning used to delineate his seven classes, but trees are grouped into a larger number of classes. The two characteristics of age and vigor were given the most importance. Four age groups were recognized, designated 1 to 4 (young, immature, mature, and overmature, as based on "physiological" age rather than chronological age); four categories of crown vigor were used, designated A to D (full, fair to moderate, fair to poor, very poor). Combining these two factors produced a classification with 16 groups (illustrated in figure 1 of the article). Field studies showed that in each age group, susceptibility increased with a decrease in crown vigor, except that in older groups there was a slight tendency for trees in vigor class C to be more susceptible than those in class D. The study also showed that bark beetles appeared to be carrying on a natural selection process in which the weaker trees are thinned out of the stand by the beetles and that survival of the dominant trees was favored. Trees with crown vigor classes of C or D were susceptible to pine-beetle attack, those with B crowns had intermediate susceptibility, and dominant, A-crown trees were resistant. Keen believed the beetles to be Nature's silvicultural agents, serving to relieve the "pressure" of severe tree competition and overcrowding. Keen also provides an example of how the susceptibility classification could be applied in marking.
Keywords: Historical document/Keen classification system/Ponderosa pine/Bark beetles/Insect susceptibility/ Dunning vigor classification.

354. **Keith, Kenneth**. **1915?** Contract form (firefighter). Form D-1/F-1. [Washington, DC]: U.S. Department of Agriculture, Forest Service. 1 p. **Size**: 3¾" x 7¾". **Notes**: An original copy.
Abstract: This is an original copy of a contract form used to hire firefighters. Although undated, the form was set up to accept a date between 1910 and 1919. This form was completed for Kenneth Keith, who was hired at $0.25 per hour as a firefighter, agreeing to work until "no longer needed." Keith was from Kooskia, Idaho, hired at McPherson, and was allowed 4 hours travel time to the fire. The form is dated August 24th (no year provided) and was accepted on behalf of the Forest Service by L. D. Smith.
Keywords: Fire fighting/Forest administration/Forest staffing/Historical document.

355. **Kellogg, F. B. 1916**. Land classification of the Umatilla National Forest, Oregon. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Umatilla National Forest]. 1:63360; [Projection unknown]; 18" x 21"; Colored Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a set of 10 map sheets that provide a land classification for the Umatilla National Forest. They were probably part of an early timber atlas. The maps depict the following information: 2,000 to 5,000 board feet per acre; 5,000 to 10,000 board feet per acre; 10,000 to 25,000 board feet per acre; woodland, cordwood, poles, etc.; grasslands, parks, meadows, open; sagebrush; brushland; land rejected on application under the Homestead Act of June 11, 1906; land applied for and classified by the Secretary of Agriculture under the Acts of June 11, 1906 and August 10, 1912 as chiefly valuable for forestry; and unclassified land held for intensive classification. Letter symbols were used to denote the following items: administrative sites; coal patents; Homestead applications (GLO); Homestead entry original; Homestead entry patented; Forest Lieu selection patented; preemption patent; restored to entry (under June 11, 1906) but not entered; State land (school); State selection pending; School selection used as base of approved indemnity; and timber and stone patent. Since the original maps were in color, it was necessary to use a vendor located at the National Archives to photograph the sheets – the color negatives were then scanned onto a Kodak Photo-CD and printed from there using Adobe Photoshop. These maps will eventually be available in the Umatilla National Forest's geographic information system. Refer to the Blue Mountain Province Data Dictionary for further information about the digital version of this accession. Of particular interest was the availability of six sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contain a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, the vendor that was used to copy the color maps was also retained to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and

8” x 10” prints for the 19 photos.
Keywords: Forest types/Historical map/Maps/Timber reconnaissance/Umatilla NF/Historical photograph.

356. **Kelsay, Laura E. 1964**. List of cartographic records of the General Land Office. Special Lists Number 19; National Archives Publication No. 64-9. Washington, DC: The National Archives, National Archives and Records Service, General Services Administration. 202 p. **Notes**: A photocopy of an original.
Abstract: This document describes the map files of the General Land Office, a government bureau engaged chiefly in the survey, management, and disposal of public lands. Although many of its functions were strictly legal and administrative in character, the surveying and mapping of the public lands were among its most important activities. Maps and associated materials are grouped into the following sections: manuscript and annotated maps; boundary survey maps and diagrams; field notes and related records; published maps; and an index. This document is especially valuable when used in conjunction with National Archives Inventory Number 167 (preliminary inventory of the cartographic records of the Forest Service; see Ashby 1967) because one describes maps for the period before establishment of the Forest Service, and the other for the period after.
Keywords: Cartographic data/Maps/Forest inventory/Forest history/National Archives.

357. **Kemp, Paul D. 1936**. Forest statistics for Walla Walla, Columbia, Garfield, and Asotin Counties, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 12 p. **Notes**: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of a forest inventory for southeast Washington counties in 1935. A small-scale map showing the distribution of the forest and nonforest zones is also included. The following topics are discussed: location and description of the counties; nonforest zone and agricultural development; the forest zone; forest types; volume of merchantable timber; ownership of forest resources; depletion and logging conditions; and social aspects. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Walla Walla County WA/Columbia County WA/Garfield County WA/Asotin County WA/Umatilla NF/Southeastern Washington/Historical document.

358. **Kemp, Paul D. 1936**. Forest statistics for Wasco County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 13 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory for Wasco County’s forests in 1935. A small-scale map showing the distribution of the forest and nonforest zones is also included. The following topics are discussed: location and description of county; forest land area and forest types; productive capacity of forest land; timber volume; depletion from cutting; and social aspects and forest influences. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Wasco County OR/Forest inventory/Mt. Hood NF/Warm Springs Indian Reservation/Historical document.

359. **Kendall, W. H. 1914**. Wenaha classification, extensive. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Wenaha National Forest]. 1:63360; [Projection unknown]; 18” x 21”; Colored Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a set of 11 map sheets that provide a timber classification for the Wenaha National Forest. They were probably part of an early timber atlas. The maps depict the following information: timber land – 2,000 to 5,000 board feet per acre; timber land – 5,000 to 10,000 board feet per acre; timber land – 10,000 to 25,000 board feet per acre; woodland – cordwood, poles, etc.; intermixture – scrubby timber, brush, and grass; brush land or chaparral; grass land – parks, meadows, open, etc.; areas covered by previous intensive classification; alienated (private) lands; rejected applications under Homestead Act of June 11, 1906; and points of elevation (indicated by numbers). Since the original maps were in color, it was necessary to use a vendor located at the National Archives to photograph the sheets – the color negatives were then scanned onto a Kodak Photo-CD and printed from there using Adobe Photoshop. These maps will eventually be available in the Umatilla National Forest’s geographic information system. Refer to the Blue Mountain Province Data Dictionary for further information about the

digital version of this accession.
Keywords: Forest types/Historical map/Maps/Timber reconnaissance/Wenaha NF.

360. **Kennedy, Joseph G. 1864**. Population and agriculture of the United States in 1860; compiled from the original returns of the eighth census. Washington, DC: Government Printing Office. 192 p.
Notes: A photocopy of an original.
Abstract: This document does not include all of the original book; only 17 pages from volume 1 (Population of the United States) and 175 pages of volume 2 (Agriculture of the United States) were copied. The portion of volume 1 includes the first three pages of the introduction (as background material) and summary tables pertaining to Oregon and the Territory of Washington. The material from volume 2 pertains to agriculture, forestry, and related topics. This section provides a fascinating history of agriculture in the United States as of 1860. Detailed tables show the current situation with respect to crops, food stuffs, domestic animals, wine making, forestry, pasturage, and anything else even remotely associated with agriculture. Small essays discuss specific topics such as the influence of the railroads on agriculture. One section entitled "preservation of forest trees" provides a thorough discussion of the many values to be obtained from trees, especially regarding their value on the farm property. It even mentions that trees are important protection against the inroads of fever, as quoted by Dr. Benjamin Rush who attributed "the unusually sickly character of Philadelphia after the year 1778 to the meadows being overflowed to the southward of the city, and the cutting down by the British army of the trees which formerly sheltered the city from the exhalations of the ground." The last five pages of material copied from volume 2 are tables summarizing the agricultural production of Oregon and the Territory of Washington as of 1860.
Keywords: Forest history/Historical document/Agriculture/Farm forests.

361. **Kenney, Nathaniel T. 1956**. Our green treasury, the national forests. National Geographic. 60 (3): 287-324.
Notes: An original copy.
Abstract: The subtitle of this article is: "men of the Forest Service manage a tenth of the country's acres and in the process provide 168,500,000 Americans with water, lumber, recreation – and solitude." This comprehensive article includes the following sections: hurried men squandered an inheritance; wind in young trees sings of new ways; watershed use gets priority; deer keep forest neat as a park; eroded hills invite flash floods; another forest product: serenity; plane sends a skier sprawling; logging on the lush Oregon coast; pines replace cotton in worn-out fields; silence reigns at chow time; worm grunters harvest bait; pests kill more trees than fire; flames can leap a mile-wide lake; experts study "blowup" fires; seeding clouds to halt lightning; and cooperating to "Keep America Green." As is generally the case with National Geographic articles, this accession has numerous high-quality color photographs depicting typical activities in, and uses of, the national forests during the early to mid 1950s.
Keywords: Community development/Fire control/Historical document/Insect control/Native Americans/Multiple use management/Range management/Timber management/Watershed management/Wildlife management.

362. **Kent, W. H. B. 1904**. The proposed Wenaha Forest Reserve, Washington and Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. 22 p.
Notes: A digital version of this report is available; filename: Wenaha5. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes an examination of the proposed Wenaha Forest Reserve in northeastern Oregon and southeastern Washington. The report includes these sections: topography; climate and precipitation (including mean monthly temperature and precipitation amounts for Walla Walla, Washington); the forest; industries; the forest as a protection cover; settlements; roads and railroads; lumbering; grazing; fire; game; sentiment; conclusions; and administration. It includes some interesting insights about early forest conditions, as illustrated with these quotes: "White fir, though of slower height growth, is far more tolerant than bull pine, reproduces fairly freely, and under normal conditions would naturally supplant the pine in time. This condition has been greatly aggravated in the portions that have been lumbered by cutting the pine and leaving the white fir. The fir, often already on the ground under the pine, springs up, and pine reproduction is thus impossible." "Thirty-five years ago the summits and upper slopes of the high interior hills probably had but little more forest cover than at present, but these high hills were then covered with a profuse growth of bunch grass, weeds, and shrubs, which have since been destroyed by small fires and sheep grazing. This growth of weeds and shrubs has been replaced largely by hard, baked earth, and often bare rock from which the scanty soil has been completely eroded." "There has been practically no lumbering on the area included in the proposed reserve. Considerable timber has been cut, however, from the foothills of the west and southwest sides. As a rule, these foothill lands are cleared after lumbering and make excellent farms. This lumbering is done on a very small scale, the mills cutting but a few thousand feet a day. The logs are sawed on the ground and the lumber marketed in the nearby towns." "Practically every portion of the reserve has suffered more or less from fire. The largest and most important of these was one which came from the present

Umatilla Indian Reservation about fifty years ago, burned up the river Umatilla, into the Reserve, then turned north along the west slope, across the heads of the Walla Wallas, and reached as far as the head of the Wenaha. This burn has generally restocked finely, principally to tamarack and lodgepole pine."
Keywords: Historical document/Wenaha Forest Reserve/Wenaha NF/Umatilla NF/Blue Mountains/Forest management/Range management.

363. **Kent, W. H. B. 1907**. Silvics narrative for Cascade (S) National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 2 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short accession consists of a one-page memorandum from the Associate Forester (Associate Chief) to Mr. E. T. Allen in the District Office in Portland, Oregon. The memo states that Kent's recommendation that a scientific study be made to determine why lodgepole pine was increasing at the expense of western yellow (ponderosa) pine in mixed stands was a good one, and that it had been referred to the Office of Silvics for their action. The other page of this item is a page from Kent's report entitled "Section II – Silvics" in which he states that "a complete study of the grave yellow pine-lodgepole problem presented on the east slope of the Cascade (S) and over nearly the entire Fremont should, I think, be made as early as possible." He mentions that great areas of the Forest vary from pure yellow pine to pure lodgepole, while intermediate mixtures are found in all percentages. He then states that a superficial examination led to the conclusion that for a considerable period of time, the lodgepole has been steadily and rapidly displacing the yellow pine. Since the area where this problem was occurring was believed to measure at least 120 miles long by 60 miles wide, the author believed that a study was warranted even if it turned out to be an expensive one. [Note that this problem was eventually studied by Thornton T. Munger – see "Report on a study of the encroachment of lodgepole pine on western yellow pine on the east slopes of the Cascade Mountains in Oregon" (dated 1908) for information about the study and its conclusions or recommendations.]
Keywords: Historical document/Lodgepole pine/Cascade NF/Fremont NF/Ponderosa pine.

364. **Kent, W. H. B. 1907**. Silvics report, Cascade (S). Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 2 p.
Notes: A digital version of this report is available; filename: Cascade1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report describes an examination of on-going timber sales in the Cascade (S) National Forest(?). The author discusses in some detail the timber sales purchased by D. M. Griffith (sold in 1906) and by Klamath Lake Mill and Lumber Company (sold in 1906). He ends the report with some general comments on the silvicultural situation for the Cascade (S) Forest, including observations such as: "the principal difficulty in securing reproduction will be in contending with inferior species."
Keywords: Historical document/Forest management/Timber sales/Cascade (S) NF.

365. **Kimmey, James W. 1955**. Rate of deterioration of fire-killed timber in California. Circular No. 962. Washington, D.C.: U.S. Department of Agriculture. 22 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: Forest fires kill an average of 131 million board-feet of merchantable timber each year in California. Forest fires also destroy young trees and forage crops, and damage the watersheds. This circular, however, is concerned with losses in merchantable timber. The young trees killed by fire are a total loss, but much of the valuable material in the merchantable trees may be saved by prompt salvage operations. This circular contains the following sections: introduction; method of study; the deterioration process; rate of decay (by species); conditions influencing rate of decay; salvage problems; and summary and conclusions.
Keywords: California/Fire effects/Historical document/Sanitation-salvage cutting/Timber defects.

366. **Kinney, Abbott**. **1890**. Forests and streams. The Century Magazine. 40: 637-638.
Notes: A photocopy of the original article published in August, 1890.
Abstract: This article was published in the "Open Letters" section of the magazine. It was a rebuttal to an article authored by Major John Wesley Powell entitled "The Non-Irrigable Lands of the Arid Region." The author is a forest officer in California. In particular, Kinney disagrees with Powell's contention that "the forests of the upper regions are not advantageous to the people of the valleys, who depend on the streams for the fertilization of the farms." Kinney cites numerous authors who have maintained that "the denudation of mountain districts is followed by increased torrent or flood action and diminished regular flow in springs and streams, often by the entire dessication of these." Kinney also cites the first report of the State Board of Forestry, which shows that "when the forests are destroyed the streams diminish."
Keywords: Forest influences/Historical document/Climate.

367. **Knechtel, Bill; Carter, Bill**. **1975**. Mountain pine beetle damage survey. Unpublished Typescript Memorandum. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 8 p.
Notes: An original copy.
Abstract: This accession consists of a one-page transmittal memorandum from the Umatilla National Forest's Timber Staff to the Regional Forester of Region 6; a wide-format table (8½" x 14"); two pages of computer printout on green-bar paper (11" x 15"); a one-page memorandum from the Deputy Regional Forester of Region 6 to the Umatilla National Forest Supervisor; a one-page memorandum from the Chief of the Forest Service (John R. McGuire) to the Regional Foresters of R1 through R6; and two pages of hand-written notes that were used by the authors when preparing the transmittal memo and the wide-format table. The table is entitled "Mountain Pine Beetle Damage Survey" and contains the following columns of information: national forest; susceptible host (species, M acres, volume MBF); salvable dead trees summarized by accessible, roadless and unavailable (M Acres, Volume MBF); salvaged in FY 1975; and immediately threatened host type summarized by accessible, roadless and unavailable (M Acres, Volume MBF). The computer printout is entitled "Extent of infestation and board foot loss in Oregon in 1974 by Forest area, insect species, and type of land" and dated 11/27/74. It provides the following columns of information for bark beetles: insect species; infestation centers; area acres; number of trees; volume/tree MBF; and volume MBF. It provides this information for "defoliators; sucking insects; other, not an insect:" insect species; infestation centers; light; moderate; heavy; and all (all in acres).
Keywords: Blue Mountains/Historical document/Insect control/Insect damage/Timber salvage/Umatilla NF/Wallowa-Whitman NF/Mountain pine beetle.

368. **Knuth, Priscilla**. **1964**. Cavalry in the Indian country, 1864. Oregon Historical Quarterly. 65 (March-December): 5-118. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article provides extensive excerpts from the journals of Captain John M. Drake, who led an expedition into "Indian Country" in 1864. With very minor changes, the journal is presented verbatim in this article. Drake commanded a cavalry expedition for service in Indian country, an area that encompassed all of eastern Oregon south of the Blue Mountains. That area was inhabited by small roving bands of Snake Indians, whose depredations on the settlements along the northern and eastern borders of the mountain country had become so frequent as to demand the attention of the military authorities. Drake's company was designed especially for the protection of the Canyon City road and the settlements north of the mountain (Canyon Mountain?). Drake's journal includes interesting accounts of eastern Oregon, including mountainous areas and with some reference to vegetation conditions.
Keywords: American Indians/Eastern Oregon/Historical document/Oregon history/John Drake/Explorer journals.

369. **Koch, Elers; Cunningham, R. N. 1927**. Timber growing and logging practice in the western white pine and larch-fir forests of the northern Rocky Mountains. Bulletin No. 1494. Washington, DC: U.S. Department of Agriculture. 37 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Describes forest management and logging practices used in the western white pine and larch-fir forests of the northern Rockies, including a discussion of the following topics: the region and its forest types; the importance and character of white pine and larch-fir forests; measures essential for growing timber in the region, including fire control, slash disposal, cutting methods, thinning, planting and other cultural practices, and pest control; and the practicality of timber growing in the white pine and larch-fir forest types.
Keywords: Forest management/Western white pine/Western larch/Silvicultural systems/Douglas-fir/Northern Idaho/Northeastern Washington/Northwestern Washington/Inland Empire/Historical document.

370. **Korstian, C. F. 1924**. Growth on cut-over and virgin western yellow pine lands in central Idaho. Journal of Agricultural Research. 28 (11): 1139-1148. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Due to the superiority of its lumber, its abundance, and its accessibility, western yellow (ponderosa) pine was considered to be the most important commercial timber tree species of the Boise, Payette, Weiser, Idaho, and Salmon National Forests in central Idaho. For that reason, it was imperative that cut-over tracts be regenerated to yellow pine as quickly as possible, and that the potential productivity of the forest type be maintained at its maximum. To secure reliable information about reproduction and its growth and development, and to determine general principles regarding silvicultural practices in the western yellow pine type, the Forest Service established a series of 16 permanent sample plots on the Payette National Forest in 1913 and 1914. This article, which reports on a 5-year remeasurement of those plots in 1918 and 1919, contains the following sections: purpose of study; general conditions on the plots; increase in number of trees; increase in volume; causes of loss; natural reproduction; application of results in silvicultural practice; summary; and literature cited. Some conclusions from the remeasurement were: the cut-over areas were in a much thriftier and more vigorous condition; the loss of vigor associated with the virgin stands was due mainly to bark-beetle infestations, dwarf mistletoe in the Douglas-fir trees, windthrow, and suppres-

sion. Those sources of tree mortality (volume loss) were largely eliminated from the cut-over stands. Net volume growth was substantially greater in the cut-over stands as compared to the virgin forest, especially since the annual losses attributed to death and decay virtually nullified the annual growth for the virgin samples. The author recommended that great care be taken in silvicultural markings so that only thrifty trees were reserved as seed trees, retaining those individuals that would survive until the next cutting cycle and continue to grow at a profitable rate. Every precaution also needed to be taken to not harm any advance reproduction during logging, since it was extremely important for regenerating the uneven-aged forests of western yellow pine promptly.
Keywords: Forest ecology/Forest management/Historical document/Natural regeneration/Selective cutting/Silviculture/Cutover areas/Payette NF/Ponderosa pine/Central Idaho.

371. **Korstian, C. F. 1924**. A silvical comparison of the Pacific coast and Rocky Mountain forms of western yellow pine. American Journal of Botany. 11 ([May]): 318-324. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: At the time this article was written, two botanical forms of western yellow (ponderosa) pine were recognized: the Pacific coast form *(Pinus ponderosa* Laws.) and the Rocky Mountain form *(Pinus ponderosa scopulorum* Engelm.). The diverse environments in which they grew also resulted in silvical differences within an individual form. This paper describes some of the silvical differences between the two forms and discusses the practical significance of any differences with regard to forest management and silviculture. It includes the following sections: differences in appearance; differences in behavior; chemical differences; differences in leaf structure; summary; and literature cited. Some plant taxonomists believed that the two forms should comprise separate species based on differences in the leaves and cones. George Sudworth, an eminent Forest Service botanist responsible for most of the early Forest Service work dealing with dendrology of western tree species, believed that the two forms should be considered as silvical forms (ecotypes?) of one variable species. In Sudworth's view, the differences were purely ecological and reflected the widely divergent soil and climatic conditions under which the two forms grew. Korstian, however, believed that the differences were genetic and clearly expressed when seedlings of the two forms were grown together in the same nursery bed. He believed that climatic forms of a plant species (varieties possessing different silvical characteristics in the case of ponderosa pine) should be recognized as taxonomically valid, even though plant taxonomy tended to concentrate exclusively on morphological characters. The main recommendation that Korstian offers from a forest management perspective is that artificial reforestation and other silvicultural practices must account for the great differences between the two varieties; for example, when planting either form, the seed used to produce the planting stock should be locally collected from sites similar to the ones to be reforested. Introduction of either variety to lands outside its natural range should be done on an experimental basis only, pending the results of long-term experimentation to determine its true adaptability from an ecological and genetic standpoint.
Keywords: Genetics/Historical document/Ponderosa pine/Silvics/Silviculture/Pacific ponderosa pine/Rocky Mountain ponderosa pine.

372. **Korstian, C. F.; Baker, F. S. 1925**. Forest planting in the intermountain region. Bulletin No. 1264. Washington, DC: U.S. Department of Agriculture. 56 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Describes early planting and nursery practices in the intermountain West, which is defined as the area between the Rocky Mountains on the east, the Sierra Nevada mountains on the west, the Salmon River in the north, and the Colorado River on the south. Seed collection, nursery practices, and field planting are discussed. The future of artificial reforestation in the area is described. Most of the examples in this bulletin are from central Utah. Excellent black and white photographs are included.
Keywords: Tree planting/Artificial regeneration/Intermountain region/Utah/Nursery practices/Historical document.

373. **Korstian, C. F.; Baker, F. S. 1922**. Is Douglas fir replacing western yellow pine in central Idaho? Journal of Forestry. 20: 755-764. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Foresters in central Idaho were concerned because Douglas-fir was apparently replacing western yellow (ponderosa) pine on many sites. To address that issue, plots were established on the Payette National Forest in the Carpentier and Big Pine Creek drainages, and in the Deadwood Basin and Silver Creek areas. All of the plots were installed in either 1913 or 1914, and then remeasured in 1918, 1919, or 1920; this article reports on the results of the remeasurements. It contains the following sections: composition of reproduction; distribution of size classes; growth on different sites; mortality and age; periodicity of reproduction; and conclusions and applications. The initial plots were installed by W. N. Sparhawk and he concluded that an invasion by Douglas-fir was not actual, but only apparent, because he found that stand composition then was about the same as it had been for the past 200 years. [Note that Sparhawk installed plots on the Payette NF between 1912 and 1914 during a study to examine the effects of sheep grazing on western yellow pine reproduction; see Sparhawk 1918 for more information about that

study.] Data summaries showed slight compositional fluctuations between species, but they could often be explained by differences in cone crops and by variations in seedling survival, since results from first-year seedling counts were not always maintained for more than a few years. Seedling mortality was extensive, with the most common causes being drought, browsing and trampling by sheep, rodent girdling, winter-killing, frost injury (a particularly severe frost in late spring of 1919 killed many seedlings), and consumption by rodents and birds. On the whole, the distribution of a cone crop in 1912 and the germination conditions in 1913 were believed to be the main factors affecting composition of the seedling stand between 1913 and 1920. Differential growth rates could be discerned for different species on the same site and the same species on different sites. It was noted that yellow pine grew much faster than Douglas-fir when the two were established on the same site, especially for open sites where the seedlings experienced essentially no competition. Mortality in the upper age classes was also examined, and it was noted that mortality of Douglas-fir continued with age at a higher rate than for western yellow pine on the same site. Their figures showed that no more than 5 or 6 percent of the one-year-old seedlings lived long enough to reach 30 years of age. An analysis of advance reproduction showed a marked periodicity in establishment of natural regeneration, with slow to moderate seedling establishment being normal and periods of unusually favorable reproduction occurring on cycles of 5 to 15 years. Favorable cycles were not synchronized between yellow pine and Douglas-fir, and could not be correlated with long-term precipitation records for Boise, Idaho. It was noted that "the whole country used to burn over every few years. The frequency and intensity of forest fires doubtless influence the periodicity of reproduction. Large fires were quite general all over central Idaho in the early eighties [1880s in this case], according to evidence shown by fire scars and the young growth." Korstian and Baker concluded that "the present composition of the forest will persist, and is not being modified appreciably by new factors introduced by man (chiefly grazing) during the last 30 years. Western yellow pine will follow western yellow pine, Douglas fir, Douglas fir, and mixtures as found today will likely continue."
Keywords: Forest ecology/Forest management/Historical document/Natural regeneration/Silviculture/Payette NF/Ponderosa pine/Central Idaho/Big Pine Creek ID/Carpentier Creek ID/Silver Creek ID/Deadwood River ID.

374. **Korstian, Clarence F. 1921**. Effect of a late spring frost upon forest vegetation in the Wasatch Mountains of Utah. Ecology. 2 (1): 47-52. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article begins with the observation that there was a dearth of information about the frost hardiness of forest trees. Korstian believed that such information was essential for a variety of reasons; he observed that in certain situations, relative frost hardiness could prove to be a determining factor in forest succession. It had long been noted that late spring frosts were more damaging to vegetation than fall frosts, presumably because they occurred when the plants were succulent and especially vulnerable to freezing temperatures. This article reports on the effects of a severe frost event that occurred throughout the Wasatch Mountains in late May of 1919. The effects were particularly pronounced because the frost episode came on the heels of four weeks of unseasonably warm weather; in fact, it had been the warmest May in 18 years. The highest temperatures of the month were recorded on the 27th and 28th, with the unusually cold weather following on the 30th and 31st. Korstian then describes frost damage in the Cottonwood Nursery, located 25 miles southeast of Salt Lake City at an elevation of 7,400 feet, where he found the pines to be generally uninjured and the spruces and firs frozen to varying degrees. Douglas-fir in the nursery beds was also severely damaged by frost. Of the native conifers growing on adjacent forest sites, he observed that the firs (Douglas-fir, subalpine fir, and white fir) were injured to a greater extent than the spruces. He noted that subalpine firs up to 18 inches in diameter, and 65 feet in height, were killed outright by the frost. The greatest amount of injury was noted in an elevational band ranging from 7,000 to 8,000 feet, primarily because tree growth was more active and advanced in that altitudinal zone than at higher elevations. Korstian also noted that damage to hardwood species – quaking aspen, box elder, alder, mountain ash, maple, Gambel oak, and elderberry – was much more severe than for the conifers. Snowberry, snowbrush ceanothus, currants, and chokecherry were also damaged to a moderate extent. The only shrub species that was apparently unharmed was the low-growing boxwood, *Pachystima myrsinites*.
Keywords: Forest influences/Frost damage/Historical document/Engelmann spruce/Mountain ash/Chokecherry/Currant/Lodgepole pine/Pachistima/Ponderosa pine/Quaking aspen/Ribes/Snowberry/Snowbrush ceanothus/Subalpine fir/Rocky Mountain Douglas-fir/Thinleaf alder/Wasatch Mountains/Western white pine/White fir/Box elder/Gambel oak/Rocky Mountain maple/Elderberry.

375. **Korstian, Clarence F. 1921**. Grazing practice on the national forests and its effect on natural conditions. Scientific Monthly. 13 (9): 275-281. **Notes**: A poor photocopy of an original.
Abstract: This article describes range management on the national forests, which is regulated with the object of using the forage resources to the fullest extent consistent with the protection, development and use of the other resources. The effects of grazing on soil erosion, gully formation, and other detrimental site impacts are described, as are the research efforts and policy directives being implemented to prevent future occurrences of such results. Some

practices used on the national forests to prevent deleterious grazing impacts are discussed.
Keywords: Grazing/Grazing damage/Historical document/Land stewardship/National forests/Range management/ Watershed protection/Soil erosion.

376. **Korstian, Clarence F. 1917**. The indicator significance of native vegetation in the determination of forest sites. The Plant World. 20 (9 (Sept)): 267-287. **Notes**: A photocopy of an original.
Abstract: This article begins by describing previous efforts (see Shantz 1911, and Kearney and others 1914) to correlate natural vegetation with the agricultural potential of an area. The author then extends that concept one step further: if native vegetation can be used to estimate the crop-producing capabilities of an area, can vegetation also be used in the determination of forest sites? He describes Cajander's classic work to relate herbaceous vegetation (undergrowth) with forest associations in many areas in Europe. The balance of this article is an excellent summary of early work on site classification using vegetative indicators. It also demonstrates how undergrowth species could be used to stratify an area into different productivity classes by using actual plot data collected in New Mexico in 1910. This article establishes the conceptual basis for habitat types, plant associations, and other related concepts expanded on later by Daubenmire and others who refined the concept in the northern Rocky Mountains.
Keywords: Forest ecology/Historical document/Indicator plants/New Mexico/Vegetation classification.

377. **Korstian, Clarence F.; Long, W. H. 1922**. The western yellow pine mistletoe: effect on growth and suggestions for control. Bulletin No. 1112. Washington, DC: U.S. Department of Agriculture. 35 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes a 12-year study on the effect of dwarf mistletoe on the growth and seed production of ponderosa pine in forests of the southwestern U.S. Impacts of dwarf mistletoe on the following tree characteristics are discussed: host growth, host longevity, timber merchantability, seed production, and silvicultural aspects. Control measures are also provided.
Keywords: Ponderosa pine/Southwestern United States/Dwarf mistletoes/Historical document/Western dwarf mistletoe/Arceuthobium campylopodum.

378. **Kotok, E. S. 1951**. Shall we prune to provide peeler logs for the future? The Timberman. 52 (10): 104, 106, 108-109. **Notes**: A photocopy of an original.
Abstract: In the late 1940s, there was widespread consideration of pruning as a silvicultural investment to improve wood quality for the future. This study was initiated to determine the natural pruning rates present in well-stocked (70% or more of normal stocking), immature (20 to 150 years of age) stands. Some 350 young Douglas-firs and 200 young ponderosa pines from 34 different stands were measured to record the height to their first limb or limb stub, the height to their lowest green limb, and their average limb diameter. The study found the bole length to the base of live crown for ponderosa pine was 17 feet at 29 years, and 33 feet at about 44 years. Those figures were assumed to represent a "clear length potential" since pruning could occur to those heights and not remove any live crown. Other results showed that dead limbs persist so long that a full 32-foot butt log does not clear until somewhere near rotation age, and that trees pruned at early ages without live crown removal could produce more than twice the cubic volume of clear wood at a reasonable rotation age.
Keywords: Forest economics/Historical document/Ponderosa pine/Douglas-fir/Pruning.

379. **Kramer, Herman J. 1938**. A brief history of the pine industry of Union, Wallowa, Baker, and Grant Counties of Oregon. Eugene, OR: University of Oregon. 76 p. Master of Arts Thesis.
Availability: University of Oregon Library. **Notes**: A photocopy of an original.
Abstract: This thesis discusses the following topics: introduction; geographical description; establishment of pine mills; general aspects of the pine industry; future prospects of the industry; notes; and bibliography.
Keywords: Blue Mountains/Eastern Oregon/Forest history/Grant County OR/Historical document/Baker County OR/Wallowa County OR/Union County OR/Timber industry/Lumber production.

380. **Kuhns, Edith Y. 1964**. The Mottet Meadows fire, Wenaha National Forest, 1919. Timberlines. 18 (June): 45-49.
Notes: A photocopy of an original.
Abstract: This interesting article was written by a relatively new forest clerk who reported to work one day to find a note that said there was a bad fire at Mottet Meadows, and that she should start trying to find tools, buy grub (3 lists were left her – one for 25 men, one for 50, and one for 100), and stay by the phone awaiting further instructions. She spent the next 6 weeks doing the office part of that fire. Although it begins with the fire episode, most of this article deals with the life of a forest clerk, especially a female one working at locations that had never had a female clerk before (previously, only male clerks had been allowed to work at the Forest or District levels).
Keywords: Forest history/Forest administration/Pomeroy RD/Wenaha NF.

381. **Kummel, J. F. 1910**. Planting on the national forests. Unpublished Paper. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 23 p.
Notes: A photocopy of an original. A digital version of this report is available; filename: Kummel1.
Abstract: This paper, which was delivered at the District 6 Supervisor's Meeting on March 25, 1910, describes reforestation practices, and attitudes, at a very early point in the administration of national forests in the Pacific Northwest. At the time of this paper, an extensive reconnaissance had been completed of the westside national forests, and approximately 600,000 acres were found to be in need of reforestation. No similar figures were available at that time for the eastside forests. Much of the early portion of this report is devoted to making the case that planting makes good financial sense, at least in the productive, westside Douglas-fir forests. The author recommends that studies be continued, and new ones begun, in order to answer the many questions surrounding reforestation. Seeding is recommended over planting, mostly because it is cheaper and was viewed as obtaining results quicker. The importance of an aggressive seed collection program is emphasized, regardless of whether future reforestation efforts concentrate on direct seeding, or planting.
Keywords: Historical document/Artificial regeneration/Direct seeding/Cone collection.

382. **Kummel, Julius F. 1918**. Final report: Fp-102(c) – test of season of planting western white pine in the Blue Mountain region. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In connection with experiments designed to test the adaptability of western white pine in the Blue Mountains region of northeastern Oregon and southeastern Washington, various plantations were established on the Whitman National Forest in 1914, 1915 and 1916. Since the experiments were repeated in two successive fall seasons and in two successive springs, they afforded an excellent opportunity to compare season of planting. The first series of plantations were installed at five different localities in the fall of 1914 and the spring of 1915, with three being in the north slope sub-type and two in the transition type. In the fall of 1915 and spring of 1916, the tests were repeated in each locality in the transition type, in two of the former localities in the north slope sub-type, and in an entirely new location in the north slope sub-type. The tests varied in size from 25 to 100 trees each. Every tree was marked by a numbered stake. According to Table 1 in this report, the seed sources for the planting stock were Crater, and Wenatchee; there is no mention of where the planting stock was grown. This report provides preliminary results from the study; results are reported separately for the north slope sub-type tests and the transition type tests. In the north slope sub-type plantings, fall planting had much lower survival than spring planting for the tests established in 1914-1915 (56 versus 86 percent), but slightly higher survival for the 1915-1916 tests (87 percent for fall; 81 percent for spring). Results were somewhat similar for the tests in the transition type. Weather, particularly winter conditions that featured severe cold directly after planting and before a protective blanket of snow had fallen, were believed to be the reason for the relatively poor performance of the fall-planted stock for 1914-1915. Weather Bureau records described December of 1914 as the "coldest and driest December in the last 25 years." Snowfall was deficient throughout that winter. In contrast, the winter of 1915-1916 featured snowfall during November and December that was above normal. The author noted that the effects of the poor winter of 1914-15 were also felt during the following growing season, since some trees were killed that winter while others survived but were weakened to the extent that they eventually died in the following summer. The report ends with these conclusions: western white pine could be planted successfully in both the north slope and transition types of the Blue Mountains and in either fall or spring; spring planting appeared to give more uniform results since there was less influence by weather conditions; fall planting is subject to heavy winter killing if weather conditions are unfavorable; due to uncertainty associated with weather conditions, fall planting was riskier than spring planting; and bud swelling before planting does not necessarily produce excessive mortality.
Keywords: Artificial regeneration/Blue Mountains/Historical document/Tree planting/Western white pine/Whitman NF.

383. **Kummel, Julius F. 1924**. Methods and season of direct seeding western yellow pine. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 21 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In the early years of reforestation work in District (Region) 6 of the Forest Service, a large number of studies were made to determine whether direct seeding could be used to restock denuded area with western yellow pine. A few of the studies were initiated by men from the District Office, but the majority were installed and examined by local Forest officers in accordance with general instructions issued by the District Office. The studies were well distributed throughout the yellow pine region, spanning sites from those that were quite favorable to yellow pine to some where the suitability for yellow pine was questionable. Some studies were initiated in the fall, others in the spring. Unfortunately, some studies included a range of sowing densities, treatment methods, etc., whereas

others included a single test only. Some study plots were examined regularly and frequently, while some were measured sporadically depending upon the press of other duties. This report includes the following sections: results (general averages, destruction of seed, methods to protect seed, mortality after germination, effect of method of seeding, pregermination of seed, season of sowing, sowing on snow, and seeding vs. planting); and conclusions. It also includes several tables, one of which (Table 1) is a long table that summarizes all studies that were installed to examine direct seeding of western yellow pine. For the Blue Mountains area, Table 1 shows that studies were installed on the Malheur NF in Little Bear Creek, on the Minam NF at Jeldnes & Perry, on the Umatilla NF at Henry Creek and Kahler Creek, on the Wallowa NF at Bear Creek, Chalk Lick, Hurricane, and Falls Creek, and on the Whitman at Columbia, Wildcat, Old Burn, Woodrat, Switchback, and Crawford Meadow. The conclusions in this final report were: at best, direct seeding is a very unreliable method for restocking denuded areas in the yellow pine region; destruction of seed by birds and rodents is one of the major factors responsible for its failure, as no practical methods were known for protecting the seed from those losses; drought was often a major factor, affecting both germination and survival after germination; seeding methods in which the seed is covered, such as seed-spotting and raking or harrowing after seeding, appeared to be superior to simply broadcasting the seed upon the ground; soaking seed before sowing may have increased germination under certain conditions; results were inconclusive regarding direct seeding in spring versus fall; and sowing seed on the surface of the snow gave no better results than sowing on bare ground.
Keywords: Historical document/Artificial regeneration/Direct seeding/Blue Mountains/Henry Creek/Heppner RD/ Kahler Creek/Malheur NF/Minam NF/Ponderosa pine/Seed germination/Tree planting/Umatilla NF/Wallowa NF/ Whitman NF/Seed predation.

384. **Kummel, Julius F. 1909**. Report on planting windbreaks along irrigation ditches, Umatilla Irrigation Project. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 12 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes a field investigation of the Umatilla Irrigation Project that was conducted from April 14-16, 1909. The project area was located in western Umatilla County in a triangular-shaped parcel bounded by the Columbia River on the north and the Umatilla River on the west to a low ridge of land on the southeast. The topography of the area consisted of a gently rolling plain with an elevation of 350 to 550 feet above sea level. The report contains the following sections: area and location; general description of the region (topography, soil, climate); local conditions affecting tree growth; advisability of tree planting (protection of irrigation ditches); species; planting sites; method of planting; source of trees; probable cost; and recommendations. The soils in the project area were of particular concern, since they were characterized as a rich, sandy loam of basaltic origin, but in some places consisted of an almost pure sand that was very light in texture and readily blown by the wind when dry. A table on page 3 summarizes temperature and precipitation records for the town of Umatilla, Oregon situated just northwest of the project area. Although the total (8.59”) and growing-season (2.18”) precipitation amounts in the project area were unsuitable for tree growth, Kummel believed that it might be possible to grow trees with supplemental irrigation for the first few years, and no irrigation thereafter. It was also believed that the water table might slowly rise as the irrigation project got underway, which would also benefit tree growth. The Reclamation Service supported the establishment of windbreaks because they could reduce soil erosion, lower project maintenance costs by slowing the deposition of sand into the water canals, and reduce water losses by shading the water canals. Kummel believed that windbreak species should be selected based on their rapid initial growth, crown form, foliage density, and average lifespan of the species. His recommendations were Carolina poplar, black locust, and western yellow (ponderosa) pine. Carolina poplar was a variety of the common cottonwood that had been recently introduced by nurserymen. It did not produce seed or cotton, and grew more rapidly than other poplars. He believed it should be planted along the ditches themselves where the quickest results were desired. Black locust did not grow as rapidly as the poplar, but it was not prone to the locust borer so prevalent in the eastern United States and its wood was valuable for fence posts and farm repairs. Western yellow pine was recommended because it was a drought-resistant conifer that would retain its foliage during the windy winter months. Based on local costs, Kummel believed that the cost would be $10.00 to $16.00 per mile of single row planted (trees planted 4 feet apart in each row), although that cost could be reduced by 25% if a nursery was established somewhere in the project area itself.
Keywords: Erosion control/Historical document/Umatilla County OR/Windbreaks/West Umatilla Project/Water development/Black locust/Ponderosa pine/Carolina poplar.

385. **Lamb, Frank Haines**. **1904**. The disposition of the Nation’s timber land. Out West. 20 (3): 207-222.
Notes: A photocopy of an original.
Abstract: This article begins with a discussion of the settlement of the western U.S., including acquisition of California from Mexico in 1848 and Washington and Oregon from England in 1846. The author then describes many of the laws that pertained to the public domain lands, most of which were oriented toward disposal of those lands ra-

ther than their conservation or sale at fair market value. Although many laws such as the Homestead Act were enacted with the Great Plains situation in mind, they could also affect forested lands in the Pacific Northwest and Rocky Mountain regions. The author describes many situations in which the Homestead Act or other laws were used to perpetrate timber fraud. Lamb proposes that forested lands be retained in government ownership, that they be managed by a forestry administration, and that timber removals consist of sales in which stumpage is awarded to the highest bidder in an auction.
Keywords: Community development/Forest reserves/Historical document/Pacific Northwest/Forest history/Timber fraud.

386. **Lamb, George N. 1915**. Willows: their growth, use, and importance. Bulletin No. 316. Washington, DC: U.S. Department of Agriculture. 52 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This early bulletin describes willow species *(Salix)* of the United States that attain tree size and have commercial importance. The characteristics of various willows are discussed, as well as the economic uses derived from them. Willow plantings, including establishment from cuttings and other vegetative propagation techniques, are also summarized.
Keywords: Willows/Silvics/Vegetative propagation/Historical document/Salix.

387. **Langille, H. D. [1903]**. Looking a little east down Wall Creek. Photo Number 41280. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Wall Creek area. **Size**: 3½" x 6".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus, although the contrast is poor for some areas. It was acquired during a reconnaissance effort conducted by Henry Langille in 1903. The objective of Langille's examination was to obtain information that could be used to determine if a forest reserve should be created in the Heppner, Oregon area. The examined area had been withdrawn from entry by Langille (under the land laws of that era) on May 29, 1903 after he learned that timber speculators had "discovered" the forest lands in the Heppner portion of the Blue Mountains and were beginning to file a large number of "timberland entries" at the land office in La Grande, Oregon. Langille examined the proposed Heppner Forest Reserve area for a 10-day period between June 20 and June 30, 1903. He produced a 32-page report after the examination (see Langille 1903 in the history archives). According to references in the report, at least 17 photographs were taken during the examination; unfortunately, only three of those photographs have been located thus far, and this photograph is one of the three. The original photo was a snap exposure, f-stop of 16, and was a sunlight exposure. The time when the photo was taken was 1 P.M. and in a S. E. direction. The column number is "38 To 89." Caption for the photograph was "Looking a little east down Wall Creek Canyon from southeast corner, showing deep canyon and character of timber.".
Keywords: Umatilla NF/Morrow County OR/Wall Creek/Heppner Forest Reserve/Heppner RD/Historical photograph.

388. **Langille, H. D. 1903**. Looking down an angle of Swail [Swale] Creek. Photo Number 41283. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Swale Creek area. **Size**: 3½" x 6".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus, although some areas of the background view are blotchy. It was acquired during a reconnaissance effort conducted by Henry Langille in 1903. The objective of Langille's examination was to obtain information that could be used to determine if a forest reserve should be created in the Heppner, Oregon area. The examined area had been withdrawn from entry by Langille (under the land laws of that era) on May 29, 1903 after he learned that timber speculators had "discovered" the forest lands in the Heppner portion of the Blue Mountains and were beginning to file a large number of "timberland entries" at the land office in La Grande, Oregon. Langille examined the proposed Heppner Forest Reserve area for a 10-day period between June 20 and June 30, 1903. He produced a 32-page report after the examination (see Langille 1903 in the history archives). According to references in the report, at least 17 photographs were taken during the examination; unfortunately, only three of those photographs have been located thus far, and this photograph is one of the three. This photo was taken with a snap exposure, an f-stop of 12, and with a sunlight exposure. The time when the photo was taken was at 3'30 (3:30 p.m.) in a N. W. direction. The column number is "38 To 90." Caption for the photograph was "Looking down an angle of Swail Creek [Swale Creek] showing typical forest conditions and character of country. Sandstone reefs. Madison Butte in distance." Ground cover: Bunch grass; Stand: Yellow Pine and Douglas Spruce [Douglas-fir]. A saddled horse, two horses with packs, and a man wearing a cocked "Ranger's" hat standing next to another saddled horse are shown in the lower foreground of this photograph.
Keywords: Umatilla NF/Morrow County OR/Swale Creek/Heppner Forest Reserve/Heppner RD/Historical photo-

graph/Rimrock.

389. **Langille, H. D. [1903]**. Looking south toward canyon of John Day River across Wall Creek. Photo Number 41275. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Wall Creek area. **Size**: 3½" x 6". **Notes**: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus, although some portions of the background view are blotchy. It was acquired during a reconnaissance effort conducted by Henry Langille in 1903. The objective of Langille's examination was to obtain information that could be used to determine if a forest reserve should be created in the Heppner, Oregon area. The examined area had been withdrawn from entry by Langille (under the land laws of that era) on May 29, 1903 after he learned that timber speculators had "discovered" the forest lands in the Heppner portion of the Blue Mountains and were beginning to file a large number of "timberland entries" at the land office in La Grande, Oregon. Langille examined the proposed Heppner Forest Reserve area for a 10-day period between June 20 and June 30, 1903. He produced a 32-page report after the examination (see Langille 1903 in the history archives). According to references in the report, at least 17 photographs were taken during the examination; unfortunately, only three of those photographs have been located thus far, and this photograph is one of the three. This photograph was taken with a snap exposure and an f-stop of 8. The time when it was taken was 1'20 (1:20 p.m.) in in a southerly direction. The column number is "38 T 88." Caption for this photograph was "Looking South toward canyon of John Day River across Wall Creek." A saddled horse is shown in the foreground standing next to a large western juniper tree.
Keywords: Umatilla NF/Morrow County OR/Wall Creek/Heppner Forest Reserve/Heppner RD/Historical photograph.

390. **Langille, H. D. 1903**. The proposed Heppner Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. 32 p.
Notes: A digital version of this report is available; filename: Heppner1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This early establishment report includes the following topics as they pertain to the Heppner Forest Reserve: introduction; area; topography; climate, precipitation, etc.; the forest; industries; the forest as a protection cover; settlements; roads and railroads; lumbering; grazing; forest fires; administration necessary; and sentiment. This excellent accession was originally accompanied by a map and some photographs, both of which would provide valuable information if they could be located. As was the case with other reports, Langille offers some interesting insights in this document: "It was everywhere observed that upon tracts upon which there is no forest cover there is no soil. At one time these areas were covered with soil to a depth of from one to two feet, and sufficient soil binding vegetation grew upon it to resist the destructive elements – wind and water – but persistent overgrazing destroyed this cover, and, there being no tree growth to protect the soil, it rapidly disappeared, leaving nothing but a bed of exposed rocks." "I have long contended that sheep would not browse upon coniferous species unless driven to it by hunger, but while watching a band ranging in open pine woods I saw an old ewe approach a pine about 3 feet in height, rise upon her hind feet, and deftly gather in, in a manner born of practice and long experience, the tender spring growth which topped the seedling." "You who have studied this question know more about it than any of us can know. Go up into the mountains and look over the situation; if you think a Reserve will benefit our county, go ahead and create it. I have confidence enough in my Government to believe that nothing will be done which will injure our county or community, and I am willing to leave it to you" (Mr. George Couser, Mayor of Heppner, as quoted in this report).
Keywords: Historical document/Heppner Forest Reserve/Blue Mountains/Umatilla NF/Forest management/Range management.

391. **Langille, H. D. 1906**. Report on the proposed Blue Mountains Forest Reserve. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 40 p.
Notes: A digital version of this report is available; filename: Bluemtn1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This important report describes conditions on approximately 3,000,000 acres that were contained in a proposed Blue Mountains Forest Reserve. The following topics were discussed: boundaries and topography; climate, including average annual precipitation amounts for 12 locations in Oregon and Washington; agricultural settlements; alienated lands; timber; the stock industry; mining camps; roads and trails; examination; public sentiment; the miner's objections; recommendations (eliminations, additions); future management of the reserves; and placer mining in the proposed Blue Mountain Forest Reserve. A short transmittal memorandum to the Secretary of the Interior, from Langille, dated April 30, 1906 is also included with the report. According to that memorandum, the report was accompanied by two maps: a map of the reserve, and a map of the mining district. Neither of those maps

were contained on the microfiche material from the University of Washington, or in the report's folder at the National Archives in College Park, Maryland. The report also references some photographs (perhaps a half dozen or so), and they also were missing from the microfiche and National Archives copies. Unfortunately, the microfiche version of this report was scratched near the bottom, resulting in several instances where one or more lines at the bottom of a page were unreadable. The version at the National Archives is very ledgible, but it was not copied – unfortunately, I forgot about the unreadable portions and didn't copy the Archives one because I knew we already had a copy. This report offers a wealth of interesting insights, as demonstrated by the following quotes: "During a number of years past the Grande Ronde Lumber Company has been operating along the Grande Ronde river and the destruction of the forests which has followed this cutting is deplorable indeed. The hillsides have been wiped clean of every thing large enough for saw timber of any kind. In many places fire has followed the cutting and the destruction is complete." "The Company's mills are located at Perry, and the logs are driven down the river. At the time of my visit millions of feet of logs were being banked along the small streams which form the headwaters of the Grande Ronde. A very few years of such work as is being done by the Company would denude the entire watershed of this stream." "During the past 20 years this Company has been actively engaged in acquiring title to timber lands, not only in this part of the State but elsewhere. It is common knowledge that their employees have been supplied with funds with which to purchase lands under the Timber and Stone Act, and it is a matter of record that these claims have been transferred to the Company on the same day or the day following receipt of patent." "Sheep from Wasco, Crook, Sherman, Gilliam, Umatilla and Morrow Counties are driven to the mountains early each season and ranged up to the very doors of the actual settlers and cattle owners. There has been some trouble in the past resulting in bloodshed, but nothing as serious as that which threatens to come about in the near future." "A few years ago Eastern Oregon was one of the best range sections of the West. The rich bunch grass waved knee deep on hill and plain in such close growth that it was mowed with machines for hay." "At high elevations there are numerous tracts of a swampy nature in which different grasses and weeds of characteristic species occur and on the hills and in old burns peavine and other forage plants grow in greatest profusion. I was told by an ex-sheepherder that about 15 years ago he drove a band of sheep into these hills and camped 40 days in one place." "The timber and water supply of the Blue Mountains is invaluable to the entire surrounding country. As I have shown the timber is in demand from points 150 miles distant; the streams flow through semi-arid plains in all directions and the latent resources of these distant lands can be developed only by the application of the waters from these mountains."
Keywords: Historical document/Blue Mountains/Blue Mountains Forest Reserve/Malheur NF/Umatilla NF/Wallowa-Whitman NF/Forest management/Range management.

392. **Langille, H. D. 1904**. Supplemental report on the proposed Chesnimnus Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. 15 p.
Notes: A digital version of this report is available; filename: Chesnim3. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes the proposed Chesnimnus Forest Reserve, an area of 185,140 acres in the Blue Mountains of northeastern Oregon. The following topics are included in the report: location and topography; area; climate; the forest; stand of timber; alienated lands; industries; grazing; sentiment; administration; and recommendations. This report supplements a very short one prepared in the same year by F. A. Clark; a copy of Clark's report is also present in the silviculture library history archives.
Keywords: Historical document/Chesnimnus Forest Reserve/Wallowa-Whitman NF/Blue Mountains/Forest management/Range management.

393. **Langille, H. D. 1903**. What a forest inspector should know. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is a paper that Langille prepared for the Society of American Foresters. Based on the first paragraph, it includes the remarks that Langille delivered at a night-time meeting of an SAF committee. At the time this paper was prepared, the forest reserves were administered by a supervisor and four classes of rangers. The forest inspector was the superior officer in the field – he was detailed to duty in those places where trouble and wrongdoing were most apparent, and was expected to set all things right. The forest inspector seemed to function as an intermediary between the local officers (supervisor and rangers) and the "office" (the Washington Office). The office was rarely familiar with the actual conditions as they existed on the reserves, and the local field forces were even less familiar with the workings of the office. The forest supervisor, a local man in the home of his friends, was surrounded by influences that prevented him from acting fearlessly and independently along the lines he was expected to follow. It was difficult for local officers to implement regulations and policies that would not prove to be equally applicable to all of the differing forest reserves in the western United States, where climatic and resource conditions varied widely. Therefore, one of the first things a forest inspector needed to learn was how to bring the office and

the field forces into a closer relationship of mutual understanding. And so it fell upon the forest inspector to go into the field, study the local conditions and needs, interpret the rules to meet those conditions and prescribe local regulations, and then to go among the field men and procure the evidence necessary to remove them from office if they have been dishonorable, set them right where they have erred, encourage them where they have done well, and point out the way of continued improvement. In order to be successful, a forest inspector had to have a good working knowledge of general land laws, forest reserve regulations, soil conditions, geology, water relations and hydrology, botany, range management, forestry, timber management and lumbering, surveying and mapping, and how to handle men and deal with people. "The more knowledge he has of forests and forest work, the easier will be his path, and there is no information which he can store away that will not be of use to him at some time."
Keywords: Forest administration/Forest reserves/Historical document.

394. **Langille, Harold D. 1956**. Mostly Division "R" days. Oregon Historical Quarterly. 57 (4): 301-313.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Subtitle of this article is: reminiscences of the stormy, pioneering days of the forest reserves. Langille was instrumental in the establishment of forest reserves in the Blue Mountains: he was the author of establishment reports for the Heppner Forest Reserve (1903), the Chesnimnus Forest Reserve (1904), and the Blue Mountains Forest Reserve (1906). In this article, Langille explains that he first became familiar with the Cascade Mountains after accepting a position as handyman at the Cloud Cap Inn on Mount Hood in 1892. While working there, he became involved in guiding tourists and his main hobby was collection of the alpine flora. Since the Inn was used as a base for scientific explorations of the area, he was exposed to leading scientists of the day, including Gannett, Pinchot, Newell, Coville, Merriam, Bailey, Sargent, Brewer, and Professor J. G. Lemmon of California. President Cleveland created the Cascade Range Forest Reserve on September 28, 1893, a withdrawal that included the Mount Hood area Langille had been working in. He discusses early grazing controversies involving sheep use of the reserve, and describes a visit from the Forest Commission of the National Academy of Sciences in 1896. During the Commission's visit, Langille interacted with Sargent and corrected his classification of Abies nobilis and pointed out a variety of Engelmann spruce that Sargent had not previously described. In 1900, Gannett asked Langille to join government service and examine the Cascade Range Forest Reserve. Early in 1902, Langille was appointed an inspector in Division R of the General Land Office, chiefly on the recommendation of Gifford Pinchot. He then describes inspection activities in eastern Oregon, including one occasion where he visited the G.L.O. office in La Grande and learned that a train car load of timber locators had arrived that morning from Minnesota and immediately left for the Wallowa country. Langille wired the Secretary and requested temporary withdrawal of all forested townships, thereby heading off the Minnesota applications. The later part of this article discusses the most controversial of all the reserve withdrawals that Langille ever worked with: the Blue Mountains Forest Reserve. He discusses meetings in Canyon City, Prineville, Greenhorn, and other towns that were instrumental in building support for the reserve, although some of those meetings were controversial and stressful.
Keywords: Blue Mountains Forest Reserve/Blue Mountains/Cascade Range Forest Reserve/Chesnimnus Forest Reserve/Forest history/Forest reserves/Historical document/Heppner Forest Reserve/Sheep grazing/U.S. Forest Service history.

395. **Larsen, J. A. 1923**. Association of trees, shrubs, and other vegetation in the northern Idaho forests. Ecology. 4 (1): 63-67. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article describes associations between the most common herbs, shrubs, and trees for the forests of northern Idaho, in order to provide insights into the quality and general characteristics of the forest habitats. The herbs and shrubs were collected at the Priest River Experimental Forest in northern Idaho. The article includes the following sections: western yellow pine forests; western larch–Douglas fir forests; white pine, cedar, hemlock, and lowland white fir forests; and literature cited. The author begins by describing the altitudinal zones of northern Idaho, with the lowest one being the western yellow (ponderosa) pine zone, followed successively by western larch and Douglas-fir, western white pine, western hemlock, western red cedar, and lowland white (grand) fir, and ultimately culminating in subalpine forests of mountain hemlock, subalpine fir, Engelmann spruce, and lodgepole pine. Larsen explains that vegetational zonation is not in response to altitude per se, but occurs because elevation results in differing temperature and moisture conditions. Western yellow pine forests occurred on flats and lower slopes at fairly low elevations. These sites supported open tree stands and an abundance of associated species; 28 grasses, forbs and shrubs are shown as occurring in this zone. The larch and Douglas-fir forests grew under somewhat better moisture conditions and tended to be denser, so associated vegetation was best developed in natural openings in the forest; 18 grasses, forbs and shrubs were listed for this zone. The mixed-conifer forest zone, which was often dominated by western white pine, was typically found on steeper, north-facing slopes with deeper soils than the other forest zones; a rich assemblage of associated species was listed for this zone (57 grasses, forbs and shrubs were shown). No description of associated plant species was provided for the subalpine forest zone.

Keywords: Forest ecology/Forest influences/Historical document/Vegetational zonation/Northern Rocky Mountains/Northern Idaho/Priest River Experimental Forest/Subalpine zone/Montane zone/Plant associations/Foothills zone.

396. **Larsen, J. A. 1918**. Climatic forest types in Montana and northern Idaho. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 94 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This long report describes a study to determine the extent and distribution of natural forest types within District I of the U.S. Forest Service (now Region 1, consisting of Montana and northern Idaho). The study attempts to describe the climatic conditions prevailing within each forest type, and the extent to which each type is controlled by differences in climate and topography. The study involved an analysis of all available climatic data from the U.S. Weather Bureau and the Forest Service, such as air and soil temperatures, wind movement, atmospheric humidity, precipitation, evaporation, and soil moisture. Some of the climatic data was collected from representative examples of forest types at the Priest River Experiment Station in northern Idaho. The report consists of 2 parts: part I deals with the regional relationships between climate and forest types; part II describes the detailed investigations conducted at the Priest River Experimental Forest. This copy appears to be a draft since it includes many annotations and revisions, and the page numbering is irregular. There are 29 photographs included at the end of the report, but their numbering sequence and captioning also appear to have been under revision. A draft, full-color map entitled "Climatic Forest Types" was also included with the report (and reproduced with this copy, although on 5, 8½" x 11" sheets since the National Archives did not have large-format color copying capability); it shows the detailed distribution of grassland, yellow pine, white pine, western larch–Douglas-fir, lodgepole pine–Douglas-fir, and alpine and barrens vegetation types in District I. It appears that the information contained in this report was published by Larsen in 1930 in the journal Ecology (see "Forest types of the northern Rocky Mountains and their climatic controls" in the history archives). It is unknown if this report was ever finalized and eventually published by the Forest Service or the Department of Agriculture.
Keywords: Forest ecology/Forest influences/Historical document/Forest mapping/Mountain climate/Plant succession/Vegetational zonation/Northern Rocky Mountains/Forest types/Priest River Experimental Forest.

397. **Larsen, J. A. 1930**. Forest types of the northern Rocky Mountains and their climatic controls. Ecology. 11 (4): 631-672. **Notes**: A photocopy of the original article published in October, 1930.
Abstract: This report describes the natural forest types of the northern Rocky Mountains in Montana and northern Idaho, their natural distribution and chief silvicultural characteristics, and to show how they are controlled by differences in topography and climate. The following topics are discussed: broad topographic and climatic controls of forest types; section lying west of the Bitterroot Range (discussions of each forest type); and Flathead and Bitterroot Valleys (discussion of each forest type). Conclusions are: climax or permanent types occur in altitudinal belts or zones; definite temperature and moisture conditions are associated with each of the climax forest belts or zones; the lower limit of each zone is determined by moisture, while the upper limit is controlled by temperature; each forest zone includes a particular and distinctive plant composition in addition to the trees; species composition varies depending upon whether an area is west of the Continental Divide or east of it because of the Divide's influence on climate patterns; specific moisture and temperature characteristics are provided for each type; and climatic differences associated with very high elevations (subalpine and alpine) are apparent.
Keywords: Climate/Forest ecology/Forest influences/Historical document/Forest mapping/Mountain climate/Plant succession/Tree distribution/Vegetational zonation/Northern Rocky Mountains.

398. **Larsen, J. A.; Lowdermilk, W. C. 1924**. Slash disposal in western white pine forests in Idaho. Circular 292. Washington, DC: U.S. Department of Agriculture. 20 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular provides the following information as related to slash disposal practices in the white pine forests of northern Idaho: standards of slash disposal; costs of slash disposal; and methods and results of slash disposal practices, including broadcast burning, and piling and burning of slash.
Keywords: Western white pine/northern Idaho/Slash treatment/Slash/Historical document/Logging residue.

399. **Lassen, Leon; Lull, Howard W.; Frank, Bernard**. **1952**. Some plant-soil-water relations in watershed management. Circular No. 910. Washington, DC: U.S. Department of Agriculture, Forest Service. 64 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: This publication was prepared to respond to a growing need by land managers, engineers, hydrologists and others for better information on how forest and range watersheds function, and how man's treatment of the land affects watershed functions. It provides a means for appraising the effects of given land conditions, treatments, and

uses on hydrologic behavior.
Keywords: Historical document/Watershed protection/Watershed management/Water quality/Forest influences.

400. **Lauridsen, Morten J. 1937**. Forest statistics for Grant County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 14 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Grant County's forests in 1935 and 1936. A small-scale map showing the distribution of forests, juniper woodlands, and nonforest areas is also included. The following topics are discussed: location and description of the county; the nonforest zone; the juniper woodland zone; forest types (sawtimber, immature, and nonstocked burns and cutover areas); noncommercial forest types; productive capacity of forest land; forest ownership; history and economic development; early history; transportation; population distribution; mining development; agricultural development; and forest exploitation. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Grant County OR/Malheur NF/Umatilla NF/Historical document/Wallowa-Whitman NF/Ochoco NF.

401. **Lawrence, W. E. 1915**. Natural vegetation of Oregon. [Place of publication unknown]: U.S. Department of the Interior, Geological Survey. 1:1000000; Polyconic; 26" x 20"; Colored Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This map was prepared by W. E. Lawrence from the Department of Botany at Oregon State College. It shows the following items: mesophytic coniferous forest, xerophytic coniferous forest, yellow pine, juniper, alpine and subalpine forest, alpine meadow, chapparal, grassland – west, grassland – east, semi-desert, marsh, and the western boundary of range area (livestock range?). A black-and-white copy of this map was made when working at the National Archives in March 1998; subsequent to that visit, an on-site vendor photographed the map and the negative then used to produce (plot) a color version. Although it is unknown what data sources were used to compile this map, it provides an interesting historical perspective of broad-scale vegetation conditions in Oregon.
Keywords: Historical map/Blue Mountains/Forest types/Oregon/Vegetation classification.

402. **Leavitt, Clyde**. **1906**. Methods in determining reserve boundaries. Forestry Quarterly. 4 (December): 274-281.
Notes: A photocopy of an original.
Abstract: This article was prepared after the forest reserves were transferred from the General Land Office in the Department of Interior to the Forest Service in the Department of Agriculture. It describes the Forest Service section responsible for examining lands, whether they were being considered for new reserves, as additions to or eliminations from existing reserves, or needed a determination about whether they qualified as agricultural lands. The following topics are discussed: examination of lands for new reserves; additions to existing reserves; and eliminations from existing reserves.
Keywords: Forest reserves/Historical document/Forest administration.

403. **LeBarron, Russell K. 1952**. Silvicultural practices for lodgepole pine in Montana. Station Paper No. 33. Missoula, Montana: U.S. Department of Agriculture, Forest Service, Northern Rocky Mountain Forest and Range Experiment Station. 19 p. **Notes**: An original copy.
Abstract: Shortly after extensive cutting of lodgepole pine for pulpwood began in Montana, the Experiment Station initiated a survey of old and new cuttings in lodgepole pine forests and reviewed publications about lodgepole pine silviculture. Results of the initial survey were published in 1947. This paper updates and clarifies the 1947 report, as well as reporting on experience gained in the five years that elapsed since the original report. This paper brings together the latest information (as of 1952) about silviculture of lodgepole pine forests in the northern Rocky Mountains.
Keywords: Lodgepole pine/Northwestern Montana/Historical document/Forest management/Silvicultural systems/Timber management.

404. **LeBarron, Russell K.; Jemison, George M. 1953**. Ecology and silviculture of the Engelmann spruce-alpine fir type. Journal of Forestry. 51 (5): 349-355. **Notes**: A photocopy of an original.
Abstract: The Engelmann spruce-alpine fir type extends from the latitude of central British Columbia in Canada almost to Mexico. In this article, the authors describe silvicultural systems that are best adapted to spruce-fir stands of the Rocky Mountains. It includes the following sections: spruce-fir: a stable type; growth; shade tolerance; seed

production; seedbed requirements; windthrow susceptibility; insect susceptibility; age-class structure; broadleaf tree and shrub competitors; silvicultural practices; British Columbia and Alberta; Colorado; Idaho, Montana, and northeastern Washington; summary; and literature cited. The authors noted that silvicultural practices varied somewhat regionally in western North America and were affected by such important considerations as watershed management requirements and local economic considerations. The following silvicultural practices were recommended for spruce-fir forests of western North America: a selection system for British Columbia and Alberta; a variable system based on 16 condition classes for Colorado; and clearcutting in relatively large blocks ranging up to 40 acres in size for Idaho, Montana, and northeastern Washington.
Keywords: Colorado/Forest management/Historical document/Idaho/Montana/Northeastern Washington/Silvicultural systems/Spruce-fir forests.

405. **Lee, Bernard**. **1934**. Beaver dam on Camas Creek below Cunningham Sheep Camp. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Camas Creek. **Size**: 5" x 4".
Notes: An original copy, mounted on heavy brown card stock.
Abstract: This is a black-and-white photograph of high quality; the image is in sharp focus throughout. The following information is provided on the brown card stock to which the prints are attached: "W MANAGEMENT Dam, Beaver. Beaver dam on Camas Creek below Cunningham Sheep Camp. Bernard Lee. July 1934." This photograph shows a moderately large beaver dam in the foreground. The middleground area is a mosaic of meadow grasses and a few lodgepole pine trees. The background is an open, mixed-conifer stand with ponderosa pines and Douglas-firs in evidence. Note: this accession also includes the negative, which is contained in a brown folder attached to the card stock on which the print is mounted.
Keywords: Historical photograph/Umatilla NF/Mountain meadows/Beaver/Lodgepole pine/Beaver dam.

406. **Lee, Bernard**. **1934**. Beaver damage to young tamarack and lodgepole pine trees. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size:** 5" x 4".
Notes: Original copies, mounted on heavy brown card stock.
Abstract: These are black-and-white photographs of high quality; the images are in sharp focus throughout. The following information is provided on the brown card stock to which the prints are attached: "W MANAGEMENT Beaver. (1) Showing young tamarack tree cut down by beaver. (2) Beaver work on lodgepole. Butler holding L.P. on stump. Bernard Lee. 7/13/34." The first photograph shows a small-diameter larch trunk that has been chewed through by a beaver. The stem is lying on the ground next to the point at which it was severed from the bole. The second photograph shows a man (presumably Butler) and a dog standing in a wet meadow area. Butler is holding up a small-diameter lodgepole pine tree that was apparently chewed off by beaver in much the same way as the young larch tree in the first photograph. Note: this accession also includes the negatives, which are contained in a brown folder attached to the card stock on which the prints are mounted.
Keywords: Historical photograph/Umatilla NF/Mountain meadows/Beaver/Lodgepole pine/Western larch/Beaver damage.

407. **Leopold, Aldo**. **1947**. Game management. New York, NY: Charles Scribner's Sons. 481 p. **Size**: 6" x 9".
Notes: An original copy, although in poor condition.
Abstract: This classic book contains the following chapters: a history of ideas in game management; mechanism of game management; properties of game populations: fluctuation and density; properties of game populations: movements, tolerances, and sex and flock habits; game range; measurement of game populations, game census; measurement and diagnosis of productivity; game refuges; control of hunting; predator control; control of food and water; control of cover; control of disease; accidents; miscellaneous techniques; game economics and esthetics; game policy and administration; game as a profession; and appendixes (bibliography, glossary, etc.).
Keywords: Big game/Historical document/Wildlife management.

408. **Leopold, Aldo**. **1928**. Proposed game survey to be conducted for Sporting Arms & Ammunition Manufacturers' Institute. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 6 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is an outline for a proposed game survey. It contains the following sections: preliminary consultations (sources of information and leadership for the survey are enumerated); outline of proposed survey (objective, method, elements, type situations, procedure, and policy); factors of productivity; and agencies (list of private and public agencies that may need to be contacted during the survey).
Keywords: Historical document/Wildlife management.

409. **Leopold, Aldo**. **1926**. What needs to be done for the ducks? Unpublished Typescript Report. [Place of publication

unknown]: U.S. Department of Agriculture, Forest Service. 24 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This article begins with the statement "Men must regard ducks with something akin to real love, else they would not disagree so much about their welfare." Conserving migratory waterfowl was a big job that included many component problems. Leopold's hope was that "if we could each look more thoughtfully at the woodpile, we would have less dispute about our individual sticks." This paper addressed that hope by proposing a program for conservation of migratory birds. "Some seem to assume that all we can hope for is to maintain an annual crop of birds as long as economic development leaves room for them. For me, that is not enough. The sight of mallards dangling red legs into a storm-swept marsh is more important to me than a better car, or a cheaper safety razor, or a little unearned increment on my vacant lot, or even another cipher on the population of my town. What is much more to the point, my boys feel the same way. I feel it in my bones that there are many people who are beginning to share this viewpoint. Some day they will have to be reckoned with." Leopold goes on to point out that migratory game differs from ordinary game in that the penalties of neglect or abuse are visited not upon the locality in which they occur, but upon the nation at large. Likewise, the benefits of conservation fall, as does the rain, upon both the just and unjust. Therefore, local incentives for conservation were largely lacking. The nation itself was the only unit large enough to put the full "propulsion" of self-interest behind a migratory bird program. For that reason, the nation must lead, and lesser units (lower levels of government, for instance) should follow. This paper has numerous references to a migratory bird bill then being considered in Congress. It (the paper) includes the following sections: objective; the migratory bird bill; state and municipal refuges and shooting grounds; rest days; regulation of private shooting grounds; regulation of overshooting; miscellaneous work; ethical education; international program; and summary. Leopold concludes this article by stating: "this program starts with the basic assumption that American marsh lands and the wild life that inhabits them are an inalienable part of our national environment; that the opportunity to understand and enjoy them is one of our American standards of living, and that such opportunity should be not only preserved as long as possible, but increased and extended for all time."
Keywords: Game refuges/Historical document/Wildlife management/Ducks/Migratory waterfowl/Hunting.

410. **Leve, Walter H. 1920**. Review of results to date in experiments 2, 4, 14, 15, 16. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 9 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The subtitle of this accession is "Test of species, western yellow pine and western white pine in the Blue Mountain Region and test of season of planting, western yellow pine and western white pine, in the Blue Mountain Region, District 6." In 1914, 1915, and 1916 a number of experimental plantations of western yellow (ponderosa) pine and western white pine were established on certain logged-off and burned areas in the Douglas-fir-larch type on the Whitman National Forest. The experimental areas had been previously covered by a stand of Douglas-fir, western larch, lodgepole pine, white fir and other true firs in varying proportions. One of the areas had been covered by a young lodgepole pine stand that had burned in 1910. Another, the Columbia area, was on the upper edge of the type in what would probably have been called the transition type under the old classification system. Western yellow pine was occasionally found in the type but not usually in any great quantity. Western white pine was not usually found in the type but was more valuable than the tree species that did occur there. Because of the fact that timber sales were being conducted in the Douglas-fir-larch type, it was desired to ascertain whether the cut-over areas could be restocked with the more valuable western yellow pine and western white pine. The experiments were designed to test season of planting as well as species, so every precaution was made to make the comparison plantations identical in every respect possible. All planting stock came from the Wind River Nursery. Preliminary results were extremely varied, ranging from 8 to 98 percent survival for yellow pine and 8 to 100 percent for white pine. Some of the heavy losses could be attributed to "extraneous" factors such as damage from gophers, porcupines, other rodents, and from trampling by sheep and cattle. As of the 1919 examination, the yellow pine seemed to be making better growth than the white pine, as described in a planting report: "thus far the yellow pine seems to be better acclimated than the white pine, the latter taking on a very bushy form with several leaders to each small tree." This report includes four tables, one of them quite long, that include information about study area locations, results, and so forth. The major conclusions of this report were: preliminary results indicated that western yellow pine was well adapted to the Douglas-fir-larch forest type in the Blue Mountains and makes thrifty growth there; weather conditions immediately following planting were the factor controlling success of either fall or spring planting; rodent injury was probably more prevalent and more severe in winter than in summer; and advanced growth before planting (such as bud burst and shoot elongation associated with healing-in of planting stock) in the spring does not necessarily result in heavy mortality.
Keywords: Artificial regeneration/Blue Mountains/Historical document/Plantation protection/Ponderosa pine/Tree planting/Western white pine/Whitman NF.

411. **Lindgren, W. [1900]**. Basalt dikes in granite in Bonanza Basin. Photo Number 170. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Cornucopia, north of Halfway, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing basalt dikes in a granite-dominated geologic formation in the Bonanza Basin area of the Cornucopia mining district (north of Halfway, Oregon). The print quality is good, with both the foreground and background portions in sharp focus. Very little vegetation appears in this photograph, although scattered seedlings and saplings of coniferous trees are present on a rocky, talus-like slope. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). This particular photograph was apparently not used in the final report, although others from the same general area were included.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Cornucopia/Bonanza Basin.

412. **Lindgren, W. [1900]**. Cable Cove, as seen from Crown Point mine. Photo Number 182. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 8 S., R. 36 E., sec. 22. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the Cable Cove area, as seen from the Crown Point Mine. [Cable Cove is located at the head of Silver Creek, northwest of Sumpter, Oregon and northeast of Granite, Oregon.] The print quality is good, with both the foreground and background portions in sharp focus. The scene depicted is a typical high-elevation subalpine setting with much of the area consisting of talus slopes or rock fields, and long stringers of forest (primarily subalpine fir) running up the drainages. There are several light-colored areas that appear to be either snowbanks, or exposed deposits of volcanic (Mt. Mazama) ash. Several groups or clumps of the subalpine fir are obviously dead, although it is difficult to tell what the cause of death might have been (no obvious evidence of recent fire, etc.). Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). This particular photograph was apparently not used in the final report, although others from the same general area were included.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Sumpter OR/Crown Point mine/Granite OR/Cable Cove/Elkhorn Mountains.

413. **Lindgren, W. [1900]**. Canyon City, Oregon. Photo Number 203. U.S. Department of Agriculture, Forest Service, Malheur National Forest. **Locality**: Main street of Canyon City, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the main street in Canyon City, Oregon. The print quality is good, with both the foreground and background portions in sharp focus. The direction of this photograph is to the south. From the shadow direction, it appears that the photo was taken sometime in the morning hours. The middleground shows activity on the street, with two children walking away from the camera, a group of adults talking on the wooden sidewalk in front of a building, a horse and buggy parked near one side of the street, and a group of people working near a pile of large rock (building material?) along one side of the street. In the right foreground, a pile of planed lumber planks is present. Many of the buildings in the photograph are still standing today. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It appears as the lower half of plate LXXIII in the final report (after page 712).
Keywords: Blue Mountains/Gold mining/Historical photograph/Malheur NF/Canyon City OR.

414. **Lindgren, W. [1900]**. Elkhorn Range from Cable Cove. Photo Number 181. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 8 S., R. 36 E., sec. 22. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the Elkhorn Mountains as viewed from the Cable Cove mining area. [Cable Cove is located at the head of Silver Creek, northwest of Sumpter, Oregon and northeast of Granite, Oregon.] The print quality is good, with both the foreground and background portions in sharp focus. The scene shows high-density forests in much of the middleground area, which is at moderate elevations. The background shows the Elkhorn Range on the skyline, with open stands or non-forested areas present beneath the summits. A fair number of dead trees are visible in this photograph, particularly in a middleground area that may encompass an old burn, but it is difficult to tell what the cause of death might have been (no obvious evidence of recent fire, etc.). Note that this photograph was acquired during an examination of the gold mining areas of the Blue

Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). This particular photograph was apparently not used in the final report, although others from the same general area were included.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Sumpter OR/Granite OR/ Cable Cove/Elkhorn Mountains.

415. **Lindgren, W. [1900]**. Golconda mine, 5 miles north of Sumpter, Oregon. Photo Number 187. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 8 S., R. 37 E., sec. 32 near Bourne townsite. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the Golconda mine located 5 miles north of Sumpter, Oregon (near Bourne). The print quality is good, with both the foreground and background portions in sharp focus. The foreground and middleground portions depict several buildings associated with the on-site mining. The forest stand around the mine has been harvested, presumably to supply props and other wood needs associated with mining, and there are numerous stumps visible in the right middleground. Several standing trees still remain and appear to be grand fir and Douglas-fir. Toward the left middleground area, most of the primary native forest is still intact. It appears that the mine area is situated in a forest stand comprised originally of grand fir, western larch, Douglas-fir, and some ponderosa pine. The ground cover appears to be grass and low shrubs. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It appears after page 664 in Lindgren's report as part of plate LXXI.
Keywords: Blue Mountains/Gold mining/Sumpter OR/Historical photograph/Wallowa-Whitman NF/Bourne OR/ Golconda mine.

416. **Lindgren, W. [1900]**. John Day valley, west of Prairie City, Oregon. Photo Number 205. U.S. Department of Agriculture, Forest Service, Malheur National Forest. **Locality**: Prairie City, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the John Day valley from a vantage point located just east of John Day, Oregon (west of Prairie City, Oregon). The print quality is good, with both the foreground and background portions in sharp focus. The vegetation is comprised of cottonwood, willows, and grass. The main stem of the John Day River is visible within some portions of the middleground of this photograph, along with several smaller streams. It appears that portions of the foreground area have been heavily grazed. In the distance, the Aldrich Mountains are visible. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It apparently was not used in the final report, although several other photos from the John Day valley were used.
Keywords: Blue Mountains/Gold mining/John Day OR/Historical photograph/Malheur NF/Prairie City OR/John Day River.

417. **Lindgren, W. [1900]**. Limestone overlying schist, Eagle Creek. Photo Number 176. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: East fork of Eagle Creek. **Size**: 8" x 10". **Notes**: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing a Triassic limestone formation overlying schist near the east fork of Eagle Creek on the south flank of the Wallowa Mountains. It is likely that the area included in this photograph is now within the southern portion of the Eagle Cap Wilderness. The print quality is good, with both the foreground and background portions in sharp focus. The vegetation is composed of grass, shrubs, and scattered grand and subalpine fir trees. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It appears after page 734 in Lindgren's report as the bottom part of plate LXXV.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Eagle Creek/Geology/Eagle Cap Wilderness.

418. **Lindgren, W. [1900]**. Limestone peak on Eagle Creek. Photo Number 179. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: East fork of Eagle Creek. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing limestone cliffs on the east fork of Eagle Creek, an area on the south flank of the Wallowa Mountains. It is likely that the area included in this photograph is now within the

southern portion of the Eagle Cap Wilderness. The print quality is good, with both the foreground and background portions in sharp focus. The vegetation in this photograph appears to consist primarily of subalpine fir, grand fir, alder, and cottonwood. The ground vegetation is apparently dominated by shrubs and grasses. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It appears after page 736 in Lindgren's report as the left-hand portion of plate LXXVI.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Eagle Creek/Geology/Eagle Cap Wilderness.

419. **Lindgren, W. [1900]**. Red Boy mill at Granite, Oregon. Photo Number 195. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Granite, OR. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the Red Boy mill in the Granite mining district located in the Greenhorn Mountains west of Granite, Oregon. The print quality is excellent, with both the foreground and background portions in sharp focus. Eleven buildings are noted in this photograph. The middleground shows the effects of recent timber harvest, with quite a few skid trails visible on the hillside. Apparently, a large number of trees had been recently harvested with most of them cut into cordwood and stacked on the ground. Perhaps the cordwood would be used to make charcoal for smelting operations. Forest management activities associated with the mining operations of this era were often detrimental to not only the future stand, but also to the land itself. However, the harvest operation depicted in this photograph appears to be better than most. From the several utility poles visible in the photo, this mill was serviced with electricity. Vegetation on the hillside behind the mill appears to be a typical mixed-conifer stand; Douglas-fir, grand fir, and western larch can all be discerned. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). This particular photograph was apparently not used in the final report, although others from the same general area were used.
Keywords: Blue Mountains/Gold mining/Historical photograph/Umatilla NF/Red Boy mill/Granite OR.

420. **Lindgren, W. [1900]**. Strawberry Butte, from near Prairie City. Photo Number 200. U.S. Department of Agriculture, Forest Service, Malheur National Forest. **Locality**: Prairie City, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing Strawberry Mountain from a vantage point near Prairie City, Oregon. It appears that this photograph was actually taken somewhere west of Prairie City, perhaps in the Indian Creek area. The print quality is moderate to poor, with blotchy areas that indicate either damage on the negative or a poorly-produced print. The foreground and middleground areas indicate that the area had received recent heavy grazing. Unfortunately, the print quality is not good enough to discern forest conditions on the lower foothills of the Strawberry Range, which is in the background portion of this scene. Some snow fields are present on the upper slopes of Strawberry Mountain, indicating that this photograph was probably acquired in early fall as snow was beginning to accumulate at higher elevations. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). This particular photograph was apparently not used in the final report, although others from the same general area were used.
Keywords: Strawberry Mountains/Blue Mountains/Gold mining/Historical photograph/Malheur NF/Prairie City OR.

421. **Lindgren, W. [1900]**. Union-Campanion mill near Cornucopia. Photo Number 169. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Cornucopia, north of Halfway, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing the Union-Campanion mill in the Cornucopia mining district located on the south flank of the Wallowa Mountains (north of Halfway Oregon). The print quality is good, with both the foreground and background portions in sharp focus. The mill-related improvements are located in the foreground and middleground, with a total of 6 buildings noted. The vegetation is composed of grass, small shrubs, and subalpine fir. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It appears after page 736 in Lindgren's report as the right-hand part of plate LXXVI.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Cornucopia/Union-Campanion mill.

422. **Lindgren, W. [1900]**. Valley of south fork [main stem] of John Day River. Photo Number 202. U.S. Department of Agriculture, Forest Service, Malheur National Forest. **Locality**: John Day, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing a view down the John Day Valley in northeastern Oregon, apparently taken from west of John Day, Oregon (somewhere between John Day and Prairie City) and looking east down the valley (toward John Day, although the town itself is not visible in the photograph since it is situated in a valley and this photograph was taken from plateau above the general level of the town itself). Print quality is moderate to good, with most portions of the foreground and background views in sharp focus. The far background shows the Aldrich Mountains in silhouette. To the left in the near distance is Little Canyon Mountain, a part of the Strawberry Mountains. From the scene depicted, it appears that this photograph may have been made to the southeast of Bear Creek, which joins the John Day River approximately 3 miles west of Prairie City, OR. The photographer states that this picture depicts the south fork of the John Day River, but it actually shows the main stem. In the center of the photograph is the John Day River, showing several areas where the river is adjoined by mid-height or tall shrubs. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). It was used in the final report after page 712, where it formed the top half of plate LXXIII. [Note: contrast this photograph with one acquired by D. F. Hewett in 1915 from almost the same spot (see Hewett 1915, "View down John Day valley" in the history archives). Hewett's photograph shows more development than is depicted in this scene and less representation of woody vegetation along the river.].
Keywords: Blue Mountains/Gold mining/John Day OR/Historical photograph/Malheur NF/Prairie City OR/John Day River.

423. **Lindgren, W. [1900]**. View of creek near North Pole mine. Photo Number 190. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 8 S., R. 37 E., sec. 28 and 29. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing a drainage near the North Pole mine approximately 6 miles north of Sumpter, Oregon near the Bourne townsite. The print quality is good, with both the foreground and background portions in sharp focus. In the immediate right foreground, a relatively smooth, native-surface road is depicted. It appears that a fire had burned through a portion of the area as indicated by the presence of snowbrush ceanothus, and a charred snag near the photo's center. The vegetation appears to be dominated by subalpine fir, grand fir, Engelmann spruce, and some Douglas-fir. The understory vegetation is apparently comprised of shrubs, grasses, and forbs. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). This particular photograph was apparently not used in the final report, although others from the same general area were included.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Bourne OR/Sumpter OR/North Pole mine.

424. **Lindgren, W. [1900]**. View west from Union-Companion mill. Photo Number 174. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Cornucopia, north of Halfway, Oregon. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: This is a black and white photograph showing an area to the west of the Union-Campanion mill in the Cornucopia mining district located on the south flank of the Wallowa Mountains (north of Halfway Oregon). The print quality is good, with both the foreground and background portions in sharp focus. The vegetation in the photograph appears to be subalpine fir and grand fir. Also noted in the photograph, extreme right foreground, is a portion of a horse's head and a road. The horse has blinders which would indicate that it was pulling a wagon. Note that this photograph was acquired during an examination of the gold mining areas of the Blue Mountains (see a report entitled "The gold belt of the Blue Mountains of Oregon" by Waldemar Lindgren (1901) in the history archives). Apparently, this photograph was not used in the final report, although others from the same general area were used.
Keywords: Blue Mountains/Gold mining/Historical photograph/Wallowa-Whitman NF/Cornucopia/Union-Campanion mill.

425. **Lindgren, Waldemar**. **1901**. The gold belt of the Blue Mountains of Oregon. In: United States Geological Survey, Twenty-second Annual Report of the United States Geological Survey to the Secretary of the Interior; 1900-1901. Part II–Ore Deposits. Washington, DC: Government Printing Office: 551-776.
Notes: A photocopy of an original located at the University of Washington Library in Seattle, WA.

Abstract: This large, thorough work describes the geology of the Blue Mountains in great detail, along with informative accounts of the mining towns and camps that sprang up in the late 1800s after the discovery of gold. It was the result of an examination of the Blue Mountains area that Lindgren completed between August and December of 1900. Many of the mining area descriptions include excellent black-and-white photographs, some of which depict landscapes showing forest conditions at the turn of the century. [Note that many of the photographs were ordered from the Geological Survey's photographic library in Denver, Colorado and are present in the history archives as separate accessions, primarily with Lindgren shown as the author.] The document contains the following sections: chapter 1, introduction; chapter II, geology; chapter III, the mineral deposits; chapter IV, detailed descriptions of the mining districts; chapter V, detailed descriptions of the mining districts (continued); and chapter VI, detailed descriptions of the mining districts (continued). In addition to the mining photographs, this work also provides maps, diagrams (cross-sections, etc.), and photos of ore and mineral specimens.
Keywords: Blue Mountains/Geology/Historical document/Gold mining/Mining towns.

426. **Litchfield, Wickliffe**. **1937**. Forest statistics for Union County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 15 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Union County's forests in 1936. A small-scale map showing the distribution of the forest and nonforest zones is also included. The following topics are discussed: location and description of the county; the nonforest zone; the forest zone and cover types (ponderosa pine, upper-slope, lodgepole pine, hardwood, and noncommercial types); sawtimber types; immature types; depletion by insects, fungus, and fire; productive capacity of forest land; sawtimber volume; forest ownership; history and economic development (agriculture and forest industries); and forest uses. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Union County OR/Umatilla NF/Wallowa-Whitman NF/Historical document.

427. **Lomax, Alfred L. 1928**. History of pioneer sheep husbandry in Oregon. The Oregon Historical Quarterly. 29 (2 (June)): 99-143. **Notes**: A photocopy of an original.
Abstract: This informative article includes the following chapters: introduction; first sheep in Oregon; forces determining Oregon's advancement; interest in livestock in the Oregon country (the Hudson's Bay Company, and the settlers); Joseph Watt; a transcontinental sheep drive; and the Willamette Valley firmly established as a sheep raising region.
Keywords: Grazing/Historical document/Oregon/Range management/Range history/Sheep grazing.

428. **Long, W. H. 1917**. A preliminary report on the occurrence of western red-rot in *Pinus ponderosa*. Bulletin No. 490. Washington, DC: U.S. Department of Agriculture. 8 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the impacts associated with a heart-rot of ponderosa pine in the national forests of Arizona and New Mexico. The causes and development of western red-rot are described, and limited recommendations for its control are provided.
Keywords: Tree diseases/Decays/Ponderosa pine/Southwestern United States/Historical document/Western red rot.

429. **Lowdermilk, W. C. 1953**. Conquest of the land through seven thousand years. Agriculture Information Bulletin No. 99. Washington, DC: U.S. Department of Agriculture, Soil Conservation Service. 30 p. **Size**: 6" x 9".
Notes: A photocopy of an original.
Abstract: This interesting and philosophical paper describes the changes that have occurred to the land during the westward course of civilization, from the Holy Lands of the Near East to the Pacific Coast of the United States. The author looks at a time period spanning 7,000 years, beginning with a detailed look at the "Holy Lands" of Babylon, Syria, North Africa and the Near East. A linkage between the rise and fall of civilizations in Mesopotamia, Lebanon, and other areas is tied to a culture's use and stewardship, or lack thereof, of the land. The paper ends with sections entitled "danger signs in America, the way to an enduring agriculture, lessons from the Old World, and an eleventh commandment." Lowdermilk offers intesting insights, as illustrated with these quotes: "We must be in possession of a certain amount of abundance to be provident: a starving farmer will eat his seed grain; you will do it and I will do it, even though we know it will be fatal to next year's crop." "An eleventh commandment: thou shalt inherit the Holy Earth as a faithful steward, conserving its resources and productivity from generation to generation. Thou shalt safeguard thy fields from soil erosion, thy living waters from drying up, thy forests from desolation, and

protect thy hills from overgrazing by thy herds, that thy descendents may have abundance forever."
Keywords: Historical document/Deforestation/Land use planning/Soil erosion/Watershed protection/Agriculture/Land stewardship.

430. **Lowdermilk, W. C. 1925**. Factors affecting reproduction of Engelmann spruce. Journal of Agricultural Research. 30 (11): 995-1009. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article describes a study to examine the reproduction of Engelmann spruce in the northern Rocky Mountains. Study areas were examined in 1920 and 1921, mostly in northwestern Montana on the Blackfeet National Forest. This article includes the following sections: introduction; seed production; reproduction studies (burned-over areas – upper altitudinal zone, in the natural forest, cut-over land – mixed stands at lower margin of type); seedling survival in cut-over stands (the Nyack tracts, the Ruby Creek area) and general conclusions. This article also contains some excellent black-and-white photographs showing vegetation conditions in spruce forests of the northern Rockies as of the early 1920s. Some conclusions of this study were: the conservation of surface soil moisture throughout the critical dry period is an essential requirement for spruce reproduction; reproduction from seed stored in the duff cannot be depended upon under any conditions; mineral soil surfaces and lightly-burned surfaces decisively favor the quick restocking of Engelmann spruce under favorable moisture conditions; and "showers" of seeds must be provided over cut-over tracts for several years following cutting to ensure successful reproduction. The author offered the following management recommendations based on results from this study: seed trees must be reserved on cut-over areas, despite the possibility of windthrow; conservation of soil moisture requires adaptation of cutting methods to aspect – on southerly exposures, a selective cut was required, whereas a clearcut was acceptable on north-facing slopes if an adequate seed supply could be ensured; the duff and litter must be broken up or burned over to secure reproduction; more intense burning than was being obtained by piling slash was recommended for natural regeneration areas; and a dense vegetative cover will render the soil as critically dry for spruce reproduction as will an exposed situation (an early observation about the effect of competing vegetation on site moisture).
Keywords: Forest ecology/Forest influences/Forest management/Engelmann spruce/Historical document/Natural regeneration/Northwestern Montana/Northern Rocky Mountains/Selective cutting/Silviculture/Cutover areas/Clearcutting/Blackfeet NF.

431. **Lowdermilk, W. C.; Hamilton, George**. **1922**. The secondary species problem. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 29 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In the western white pine stands of northern Idaho, particularly in the area of the Coeur d'Alene and Kaniksu National Forests, a considerable portion of the timber volume was considered unmerchantable for one of two reasons – there was no market demand for it, or because the trees were defective due mostly to stem rots. This presented a problem because when the valuable white pine was harvested, a moderately dense stand of tolerant, low-value trees (primarily western hemlock and grand fir) was left behind and they created too much shade to allow white pine reproduction. Since the tolerant species were unmerchantable, their removal or disposal was generally an expensive proposition. This report describes the results of a study that had two objectives: 1) determine the proper treatment for stands containing unsound hemlock and grand fir; and 2) determine the most economical and satisfactory method of opening up a stand so as to secure restocking by western white pine. The report includes the following sections: introduction; the problem; premises; the object and scope; discussion; sanitation marking; summary; general conclusions; and an addendum. The general conclusions of this study were: 1) the destruction of sound hemlock or grand fir is not justifiable; 2) the liability of girdled trees is equal to the expense of disposing of the mat of slash caused by the windthrown trees; 3) portions of the stand which will not pay their own way in sanitation measures should be excluded from the timber sale area; 4) the girdling of defective secondary species is justifiable within certain restrictions; 5) the girdling of trees along trails, roads, and streams to a distance of one chain on each side is unwise and unsafe; and 6) a method of treatment involving a sanitation marking will more nearly satisfy the requirements for restocking and reduction of the fire hazard to a safe level than other methods that were traditionally used. The report includes numerous tables and four figures comprised of black-and-white photographs that depict the plot areas after treatment.
Keywords: Cutover areas/Forest economics/Historical document/Silviculture/Selective cutting/Timber defects/Timber sales/Inferior tree species/Kaniksu NF/Northern Idaho/Grand fir/Western hemlock/Western white pine/Coeur d'Alene NF.

432. **Lull, Howard W. 1949**. Forest influences: growth of a concept. Journal of Forestry. 47 (9): 700-705.
Notes: A photocopy of an original.
Abstract: This article was authored by a "conservationist" from the Intermountain Forest and Range Experiment

Station at Ogden, Utah. At the time it was prepared, there was considerable thought and debate in the forestry profession about a concept referred to as forest influences. In support of that philosophy, the author traces the growth of forest influences from its beginning in myth to the present, pointing out how beliefs in forest influences affected the course of conservation.
Keywords: Forest ecology/Forest influences/Historical document/Mountain climate.

433. **Lynch, D. Lester**. **1940**. Forest statistics for Cowlitz County, Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 14 p. **Notes**: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Cowlitz County's forests in 1933 and 1939. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; inventory; site quality of forest land; depletion; growth; trends in timber supply; forest problems; and summary. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Cowlitz County WA/Forest inventory/Columbia NF/Historical document.

434. **Lynch, Donald W. 1958**. Diameter growth of young ponderosa pine trees in the Inland Empire. Research Note No. 59. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 3 p. **Notes**: An original copy.
Abstract: The tree tables presented in this note are designed to predict future 10-year diameter growth of young ponderosa pine trees. They are based on data that was gathered in the Inland Empire and used for the preparation of cubic-foot growth tables. The data are based on increment core measurements, for the decade 1939-1948, that were collected from about 5,000 trees.
Keywords: Diameter growth/Ponderosa pine/Historical document/Timber yields.

435. **Lynch, Donald W. 1959**. Effects of a wildfire on mortality and growth of young ponderosa pine trees. Research Note No. 66. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 8 p. **Notes**: A photocopy of an original.
Abstract: Fire occurs in young ponderosa pine stands, whether it occurs as wildfire or a prescribed burn to reduce slash or natural fuel accumulations, or for irregular thinning. Regardless of whether is accidental or planned, foresters need to be able to appraise its effect on future mortality and growth. The author reviews four studies that examined fire effects on ponderosa pine, but all of them had been completed in mature stands. The study described in this note was installed in a 30- to 40-year old pine stand on the Colville Indian Reservation in Washington. The stand was burned by a wildfire in July 1949. After the fire, 200 trees were selected and tagged for long-term monitoring. They were assigned to one of 8 damage classes based on the percentage of their crown killed by the fire. Other tree characteristics were recorded, such as diameter, height, and crown class. First-year mortality was closely related to crown injury and tree diameter; high amounts of crown injury (90% or more of the crown killed) were associated with mortality, and more small trees died for the same amount of crown scorch than large trees. Mortality was not related to crown class (dominant, codominant, etc.) except as crown class was correlated with tree diameter. Second-year mortality was erratic and may have been related to severe amounts of bole scorch, especially for small-diameter trees. No trees that were 6" DBH or greater died during the second year unless their crown scorch had been 80% or more. Trees who experienced less than 50% crown scorch had little or no reduction in diameter growth; higher amounts of crown scorch produced reductions of 30 to 50% in diameter growth. No correlation between fire damage and height growth was noted.
Keywords: Fire effects/Forest fires/Historical document/Ponderosa pine/Northeastern Washington/Colville Reservation.

436. **Lynch, Donald W. 1954**. Growth of young ponderosa pine stands in the Inland Empire. Research Paper No. 36. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 14 p. **Notes**: An original copy.
Abstract: The Inland Empire region of the western United States experienced accelerated logging after World War II. Record lumber prices and increased demands for building materials have encouraged large and small operators alike to search out sources of raw material. With virgin stands of timber less and less accessible, the natural trend has been to exploit young second-growth stands that became established after the early logging in the region.
Keywords: Historical document/Second-growth stands/Timber management/Timber harvesting/Silvicultural sys-

tems.

437. **Macdaniels, E. H. 1941**. Twenty-five national forests of North Pacific region. Oregon Historical Quarterly. 42: 247-255. **Notes**: A photocopy of an original.
Abstract: This article describes the history of the establishment of national forests and forest reserves in the Pacific Northwest Region. The original establishment dates are provided for each national forest, as are the dates of additions, deletions, and combinations of land areas.
Keywords: Historical document/Forest history/Pacific Northwest Region/Umatilla NF/Wenaha NF/Heppner NF/ Whitman NF/Blue Mountains NF.

438. **MacLean, Colin D.; Hightree, Paul E. 1959**. Forest statistics for Skagit and Whatcom Counties, Washington. Forest Survey Report No. 133. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 47 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1957, of Skagit and Whatcom Counties, which were initially inventoried in 1931-32. The following topics were discussed: preface; description of the counties; significant findings in the forest inventory (land classification, commercial forest land area, commercial forest land timber volumes, forest ownership, log production); summary tables; forest survey procedure; accuracy of 1957 reinventory data; differences in results of inventories; definition of terms; and tree species. A map shows the location and distribution of forest stand-size and condition classes in the counties (sawtimber, young-growth, noncommercial forest, nonforest). Twenty-six tables of statistics are included.
Keywords: Forest inventory/Historical document/Skagit County WA/Whatcom County WA/Mt. Baker NF/North Cascade Primitive Area/North Fork Nooksack Natural Area/Glacier Peak Limited Area.

439. **MacLean, Colin D.; Orr, Wayne . 1960**. Forest statistics for Umatilla and Union Counties, Oregon. Forest Survey Report 135. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 43 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1957-1958, of Umatilla and Union Counties, which were initially inventoried in 1936. The following topics were discussed: description of the counties; significant findings of the forest inventory (land classification, commercial forest land area; commercial forest land timber volumes, forest ownership, log production); summary tables; forest survey procedure; accuracy of 1957-58 reinventory data; differences in results of inventories (1936 to 1957-58); definition of terms; and tree species. A generalized forest type map shows the location and distribution of forest types in the two counties. Twenty-five tables of statistics are included.
Keywords: Forest inventory/Historical document/Eastern Oregon/Umatilla County OR/Union County OR/Umatilla NF/Wallowa-Whitman NF.

440. **Mansfield, H. Robert**. **1939**. A plan of management for Clearwater Working Circle. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Umatilla National Forest]. 35 p. **Notes**: An original copy. A digital version of this report is available; filename: Umatilla9.
Abstract: This management plan was prepared for the Clearwater Working Circle, which was contained in the Asotin Ranger District of the Umatilla National Forest. It includes the following sections: introduction; description of the working circle (location, topography, soils, climate); management problems (social and economic situation, forest resources and conditions (ownership, forest types, timber volumes, depletion, growth, sustained yield capacity, transportation facilities, fire, insect, and disease protection, silvicultural practices, marketing, acquisition possibilities, planting, and research problems); and solutions and plans (management of national forest timber, cooperation and coordination with other owners, plan for social stability, and miscellaneous). This document also contains 5 maps and numerous tables that are not reflected in the page count.
Keywords: Historical document/Clearwater Working Circle/Asotin RD/Umatilla NF/Blue Mountains/Forest management.

441. **Marsh, C. D. 1929**. Stock poisoning plants of the range. Bulletin No. 1245. Washington, DC: U.S. Department of Agriculture. 74 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.

Abstract: This publication describes common or important plants that poison livestock in the western U.S. Many common species are described, as are the symptoms they produce when consumed by livestock. The following plants, or plant groups, are included: sleepy grass, arrow grass, death camases, oaks, greasewood, larkspurs, chokecherries, lupines, poison bean, loco weeds, Astragalus, coyotillo, water hemlock, heaths, milkweed, cocklebur, sneezeweed, asters, rubber weeds, goldenrods, bracken fern, and plants in the nightshade family.
Keywords: Grazing/Range management/Poisonous plants/Historical document.

442. **Marsh, C. Dwight; Clawson, A. B. 1922**. The death camas species, *Zygadenus paniculatus* and *Z. elegans*, as poisonous plants. Bulletin No. 1012. Washington, DC: U.S. Department of Agriculture. 25 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes a study about the effects of 2 death camas species, each of which is a poisonous plant, on cattle and sheep. Both of the plants are described and illustrated. The effects of their ingestion by livestock are described with narratives and photographs.
Keywords: Poisonous plants/Range management/Death camas/Grazing/Historical document/Zygadenus paniculatus/Zygadenus elegans.

443. **Marshall, Rush P.; Waterman, Alma M. 1948**. Common diseases of important shade trees. Farmers' Bulletin No. 1987. Washington, DC: U.S. Department of Agriculture. 53 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: Shade trees represent an enormous economic investment in the United States. In addition to their monetary value, shade trees provide aesthetic and sentimental benefits that are difficult to quantify economically. Shade trees can be killed or disfigured by chronically poor environmental conditions or by a variety of insects and diseases. This bulletin describes the chief characteristics of diseases affecting 41 tree species or genera. General treatment recommendations are also discussed for each disease. The bulletin contains the following sections: causes of shade tree diseases; common types of diseases; control methods; diseases of specific trees: causes and control; and disease index.
Keywords: Shade trees/Historical document/Tree diseases/Disease control.

444. **Mason, D. T. 1915**. The life history of lodgepole pine in the Rocky Mountains. Bulletin No. 154. Washington, DC: U.S. Department of Agriculture. 35 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This early bulletin provides the following information about lodgepole pine forests in the Rocky Mountains: distribution, climatic and silvical requirements, reproduction, stand density, fire effects, growth, causes of injury, ground cover plants, age classes and timber yield, and effects of thinning and other management practices. During his work, Mason recognized some of the indicator significance associated with certain plants occurring in lodgepole pine stands. For example, huckleberry *(Vaccinium scoparium)* was associated with poorer lodgepole pine sites, while alder *(Alnus tenuifolia)* and willow frequently occurred on the moister, more productive lodgepole areas.
Keywords: Indicator plants/Lodgepole pine/Rocky Mountains/Timber yields/Silvics/Fire effects/Historical document.

445. **Mason, D. T. 1915**. Utilization and management of lodgepole pine in the Rocky Mountains. Bulletin No. 234. Washington, DC: U.S. Department of Agriculture. 54 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This comprehensive bulletin covers the following topics as they relate to lodgepole pine in the Rocky Mountain states: ownership and supply, wood characteristics, uses, fire effects, annual harvests, harvesting methods, production and selling costs, use for charcoal, management practices, suggested marking guides, reforestation practices, and protection from insects, diseases and other damaging agents. An appendix provides volume and stem taper tables for a variety of products and geographic locations.
Keywords: Lodgepole pine/Rocky Mountains/Silvics/Forest management/Historical document.

446. **Mattoon, W. R. 1928**. The farm woods: a savings bank paying interest. Leaflet No. 29. Washington, DC: U.S. Department of Agriculture. 8 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in September, 1928.
Abstract: Timber is a crop, grown from the soil. Timber is usually not a major emphasis of the farm, but may bring in a substantial amount of the farm income. Timber and wood are required for the successful operation of the farm, and most farmers have some lands that are best adapted to tree growth. Timber is a farm savings bank to be drawn upon in times of need. If it is drawn upon only to the extent of cutting the growth, or interest, the capital remains untouched and the basic investment continues undiminished. This leaflet contains the following sections: using timber rightly; cutting for continuous growth; and marketing timber.
Keywords: Farm forests/Historical document/Timber management.

447. **Mattoon, W. R.; Reed, C. A. 1932**. Planting black walnut. Leaflet No. 84. Washington, DC: U.S. Department of Agriculture. 8 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in January, 1932.
Abstract: Black walnut is widely known because of its value for both timber and nuts. The nuts and timber can add appreciably to the value of a farm. This bulletin describes the basics of how to plant black walnut trees. It includes the following sections: essentials in planting; choosing soil and location; when to plant – spring or fall; what to plant – nuts or seedlings; where to get nuts and small trees; handling the nuts; how to plant nuts; how to grow small trees for planting; how to plant small trees; how to space nuts or trees; interplanting with filler trees or crops; protection and pruning; and further information.
Keywords: Historical document/Black walnut/Tree planting.

448. **Mattoon, Wilbur R. 1940**. Forest trees and forest regions of the United States. Miscellaneous Publication No. 217. Washington, DC: U.S. Department of Agriculture. 54 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: This publication was originally issued in January 1936. It contains the following sections: introduction; natural groups of forest trees; native trees in great variety; descriptive list of native forest trees; forest trees of the United States; forest regions of the United States; northern forest region; central hardwood forest region; southern forest region; tropical forest region; Rocky Mountain forest region; Pacific coast forest region; forests of Alaska; forests of Puerto Rico; forests of Hawaii; tree labels; and publications on forest trees. This document includes many good illustrations in the form of black and white photographs and line drawings.
Keywords: Dendrology/Forest types/Historical document/Silvics/Tree distribution/United States.

449. **Mattoon, Wilbur R. 1941**. Growing black locust trees. Farmers’ Bulletin No. 1628. Washington, DC: U.S. Department of Agriculture. 30 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in May, 1930; revised May 1937; this version is a slight revision released in January, 1941.
Abstract: Trees producing wood that is durable when used in the ground are in high demand. Of the few native species that meet that requirement, the black locust ranks high. It is much in demand for use as fence posts, stakes, and poles. Black locust also has a strong, spreading root system that makes it effective at checking soil erosion and, for that reason, it is planted extensively for erosion control purposes. Although black locust offers many benefits, it can be seriously affected by an insect called the locust borer. Since borer damage seems to vary by tree vigor, it is important to plant locust on sites to which it is well adapted so that it can maintain high vigor levels and ward off attacks by locust borer. This bulletin contains the following sections: where black locust grows; uses of the wood; black locust for checking erosion; growth; growing black locust seedlings; planting black locust seedlings; shipmast locust; injurious insects; care and cultivation; production of timber; profits; and further information.
Keywords: Black locust/Farm forests/Historical document/Insect control/Insect damage/Erosion control/Tree planting/Locust borer/Shipmast production.

450. **Mattoon, Wilbur R. 1938**. How to cut southern farm timber for steady profit. Leaflet No. 153. Washington, DC: U.S. Department of Agriculture. 8 p. **Size**: 6” x 9”.
Notes: An original copy. Issued in March, 1938; this version is a slight revision dated August, 1938.
Abstract: New pulp and paper mills were being built in the southern United States throughout the late 1930s, thereby creating new markets for wood. Those mills require a steady supply of raw material for their continued existence. Wise landowners will plan to capitalize on that need by growing and harvesting continuous, sustainable crops of wood. Farmers have often made the mistake of cutting their woods too heavily, which does not retain enough growing stock to ensure another harvest in a reasonable length of time. This bulletin describes many of the principles governing management of southern forests, especially southern pine forests, with an emphasis toward proper application of selective cutting. Six principles of selective cutting are provided: select and mark each tree to be cut; cut low stumps; cut the tree into the most usable or best paying product; avoid injuring the other (leave) trees; be careful with fire – it is the woods’ worst enemy; and always leave plenty of trees as growing stock, as they are the capital in the woods bank.
Keywords: Historical document/Southern pines/Timber management.

451. **Mattoon, Wilbur R. 1942**. Pruning southern pines. Farmers’ Bulletin 1892. Washington, DC: U.S. Department of Agriculture. 34 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in January, 1942.
Abstract: The growing of pines in the South as a crop on the farm, whether for home use or as a source of cash income, or on a larger scale as a commercial enterprise for profit is well on its way as one of the South’s most profitable developments. Better management of growing timber calls for protection from fires, the improvement of stands by thinning or cutting out the unpromising trees, and pruning the promising trees where natural pruning does not take place. By far the bulk of the pine timber in the South is growing in understocked stands, stands having too few trees per acre. Such uncrowded trees generally grow rapidly in diameter and branch freely, with the result that

the trunks taper sharply and have a high percentage of sapwood and many knots. Proper pruning of young trees practically guarantees high-quality lumber, as knots constitute the only common defect in second-growth southern pine timber. Early pruning, when the trees are relatively small, tends to keep the cost within economic limits, and small clean trees mean large trees of high quality. Such trees, in turn, mean increased profits from the growing of timber as a crop.
Keywords: Forest management/Farm forests/Forestry extension information/Historical document/Southern pines/Tree pruning.

452. **Mattoon, Wilbur R. 1940**. Southern pines pay: a story in pictures. Miscellaneous Publication No. 357. Washington, DC: U.S. Department of Agriculture. Variable p. **Size**: 6" x 9".
Notes: An original copy. Issued initially in November, 1939; this version is a revision dated June, 1940.
Abstract: Timber growing or forest farming is now a major industry in the South. Timber farming means protecting trees and forests from fire and using the ax and saw rightly. When timber cutting is rightly done, the products generated will usually pay for the operation. Good practice also involves pruning the lower limbs, which increases both the quality and the value of the resulting timber growth. Small owners are cutting their timber when too young, cutting only the most promising trees, or cutting the stands too clean. The average small owner should cut lightly and frequently. Because trees grow rapidly, timber farming in the South is not difficult. This bulletin illustrates those concepts using a series of black-and-white photographs from the Forest Service's photo collection, along with explanatory narratives.
Keywords: Farm forests/Forest management/Forestry extension information/Historical document/Southern pines/Thinning/Artificial regeneration.

453. **Mattoon, Wilbur R.; Barrows, William B. 1940**. Measuring and marketing farm timber. Farmers' Bulletin No. 1210. Washington, DC: U.S. Department of Agriculture. 57 p. **Size**: 6" x 9".
Notes: An original copy. This version supersedes Farmers' Bulletin No. 715, entitled "Measuring and Marketing Farm Products." Originally issued in September 1921; this version was slightly revised in September 1940.
Abstract: This bulletin was prepared to inform farmers about the different kinds and grades of timber products, the methods of estimating and measuring them and ascertaining their real value, the methods of selling, the markets, and the current market prices. It includes the following sections: introduction; principal wood products; units used in the measurement of timber; scaling timber; estimating standing timber; finding the sale value of standing timber; markets and prices; shipping by rail; when to sell; how to sell; the small sawmill; cooperation in marketing; how to prevent the deterioration of cut wood products; and practical helps in marketing.
Keywords: Farm forests/Historical document/Wood utilization.

454. **Mattoon, Wilbur R.; Dille, Alvin**. **1920**. Forestry lessons on home woodlands. Bulletin No. 863. Washington, DC: U.S. Department of Agriculture. 46 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin was prepared to explain basic forestry concepts for farm woodlands. Its intended audience was extension specialists and small woodland owners. It was also designed to be used by teachers at the elementary school level, especially those teaching agriculture courses. A list of other bulletins and information sources that are good resources for instructors is provided, as are some example lesson plans related to forestry and farm woodlot management. It also provides a key to common trees, as well as the name, distribution, and some comments for 100 important tree species.
Keywords: Forestry education/Forestry extension information/Farm forests/Historical document.

455. **Matz, Fred A. 1915**. Cost report on the reconnaissance examination of the Burnt River project. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 20 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report is a long and detailed accounting of the costs associated with the Burnt River reconnaissance examination on the Whitman National Forest. The report is labelled "Part II, Costs" but no part I report (the descriptive survey?) was located at the National Archives. However, this report is much more detailed than cost reports prepared by Matz for later survey projects (the later reports were typically 4 pages; this report is 20 pages) and actually includes some of the survey results in the narratives. The report includes the following sections: acreage and mileage; expenses; field work; headquarters office work; and totals. In 1915, approximately 33,531 acres were examined as part of the reconnaissance survey, with the examination consisting primarily of a 5 and 10 percent cruise of the timber volumes present on the area. During the cruise, some information was also obtained for 518 acres of patented (private) land within the reconnaissance area. Control lines were established throughout the project area in order to obtain topographic data for mapping purposes. Much transit work was completed to obtain relative elevations for the control points. Compass lines were also run in much of the project area, especially for ar-

eas where the section lines had been previously surveyed. A total of 95½ miles of control line was established in the project area. A total of 397 miles of strip cruise was completed through the timbered portion of the area. The author provides a detailed break down of the costs, summarizing items such as subsistence supplies, cook's wages, hauling costs, travel expenses, equipment and miscellaneous expenses, salaries, and costs associated with sundays, holidays, rain, and leave. The project involved compilation of topographic base maps, timber type maps, and block & compartment maps, and the costs for that work are also enumerated. The author concludes by stating that the cost per acre for the net area cruised was $.067 per acre; the average cost per thousand board feet of timber cruised was $.0065.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Wallowa-Whitman NF/Whitman NF/Burnt River.

456. **Matz, Fred A. 1933**. Descriptive report, Bear [Rock] Creek timber survey project, Umatilla National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 20 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Note that this report references Bear Creek on the cover and the title page but, according to the map and the narrative in the introduction, it actually pertains to the Rock Creek area. In anticipation of an application by the Kinzua Lumber Company (whose mill was located at Thirty Mile Creek about five miles west of the Forest boundary and about 20 miles southeast of Condon, Oregon) for the purchase of Government timber located in the Rock Creek watershed of the Umatilla NF, a timber survey project was authorized and field work conducted during the summer and fall of 1933. The project area was situated at the western end of the Heppner Ranger District and within the Condon Working Circle. The town of Heppner was located about forty miles northeast of the tract. Condon was about 20 miles northwest of the western boundary of the project area. The project area included 17,347 acres within portions of the Heppner and Spray blocks (a block was a subdivision of a working circle). This report documents the results of the survey. It includes the following sections: project map (in color, showing the boundaries of the examined area, the portion of the project area that was recommended to be surveyed, the portion that was actually covered, the boundaries of blocks, the boundaries of compartments, and alienated or private lands); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. The report includes three long tables summarizing the survey results by species, size class, compartment, etc. The project area consisted of the ponderosa pine cover type (61% of the area), the white fir/larch/Douglas-fir type, and grass and sagebrush types. The report mentions that timber estimates and topographic information was recorded on 4-inch-to-the-mile blue-line maps for each township in the project area. Unfortunately, those maps were not included with this report or located elsewhere in the National Archives. Survey work was completed by a large crew of estimators (14 in total), most of whom were forestry students or recent forestry graduates. However, not all of those employees were able to stick with the job, as three of them served only a few days and quit because they "couldn't stand the strain." The author stated that the three men probably quit due to lack of interest in the work or no desire for it, rather than any physical incapacity to complete the job. When working in the west end of the project area, a "side camp" was established at "the Notch" and was eventually moved seven miles east of there to Long Prairie. Appended to the descriptive report is a separate 3-page Cost Report, dated November 14, 1934. The cost report includes the following sections: acreage and mileage; expenses; field work; headquarters, office work; and summarized cost of project.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Umatilla NF/Heppner RD/Condon Working Circle/Rock Creek.

457. **Matz, Fred A. 1932**. Descriptive report, Camas Creek timber survey project, Umatilla National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 71 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In anticipation of an application by the Mt. Emily Lumber Company (whose office and mill were located at La Grande, Oregon) for the purchase of Government timber located in the Camas Creek area of the Umatilla NF, a timber survey project was authorized and field work conducted during the fall of 1930 and the summer of 1931. This report documents the results of that survey project. It includes the following sections: project maps (2 maps in color, showing the boundaries of the examined area, the portion of the project that was completed in 1930, Government Land Office land lines that were retraced using a compass and chain (vertical control established with an altimeter), the boundaries of blocks, the boundaries of compartments, and patented or private lands); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. The report includes 13 long tables summarizing the survey results by species, size class, compartment, etc. The report mentions that timber estimates and forest type information was recorded on blue-line maps at a scale of 4-inches-to-the-mile. Unfortunately, those maps were not included with this report or located elsewhere in the National Archives. Survey work was completed by a large crew of estimators, most of whom were forestry students or recent

forestry graduates (from Iowa State College, Oregon Agricultural College, New York State College, University of Minnesota, University of Washington, Washington State College, Royal School of Forestry in Sweden, etc.). This project area included lands now administered by the Umatilla NF and the Wallowa-Whitman NF. The eastern portion included parts of the Starkey Experimental Forest and an area north of Frog Heaven Meadow (La Grande RD, Wallowa-Whitman NF). The majority of the survey area (the western two-thirds) encompassed lands now administered by the North Fork John Day RD, including a small tract southeast of Ukiah, Oregon near Hello Boy Spring. It is interesting to note that prior to the 1931 field season, the Forest Service entered into an agreement with the Mt. Emily Lumber Company to map patented lands within the project area, for which the Service was paid 4 cents per acre. [Note that the results of this timber survey were used to prepare a large timber sale that was eventually offered to the Mt. Emily Lumber Company of La Grande, Oregon in 1937; see Stevenson's (1937) "Sale prospectus and timber appraisal report; Camas Creek Unit" in the history archives for more information.]
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Wallowa-Whitman NF/Umatilla NF/North Fork John Day RD/La Grande RD/Camas Creek/Mt. Emily Lumber Company.

458. **Matz, Fred A. 1929**. Descriptive report, Chesnimnus timber survey project, Wallowa National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 60 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The Chesnimnus timber survey project was initiated after the East Oregon Lumber Company (whose office and mill were located at Enterprise, Oregon) made informal application for the purchase of Government timber that was tributary to their logging railroad line near Joseph Creek. However, that company suffered financial reversals shortly after their application, although the Bowman-Hicks Lumber Company (La Grande, Oregon) was also interested in a timber sale in the project area. This survey project included an area of 81,717 acres of government-owned land approximately 24 miles northeast of Enterprise, Oregon. All but 25,000 or 30,000 acres of that total was surveyed in this project. The report includes the following sections: a project map (in color, showing the boundaries of the examined area, the portion of the project completed in 1928, alienated lands, section lines that were re-traced for control, and delineation of 3 blocks and numerous compartments within the area); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. It also includes 14 long tables summarizing the survey results by species, size class, compartment, etc. The report mentions that timber estimates and forest type information was recorded on blue-line maps at a scale of 4-inches-to-the-mile. Unfortunately, those maps were not included with this report or located elsewhere in the National Archives. Appended to the descriptive report is a separate 4-page Cost Report, dated March 20, 1930, including a separate title page. The cost report includes the following sections: acreage and mileage; expenses; field work; headquarters office work; and summarized cost of project.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Wallowa-Whitman NF/Wallowa NF.

459. **Matz, Fred A. 1926**. Descriptive report, Hilgard timber survey project, Umatilla National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 38 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In February of 1925, the Mt. Emily Lumber Company (whose office and mill were located at La Grande, Oregon) made application for the purchase of Government timber located at the head of Five Point and Owsley Creeks in the Umatilla NF due north of Hilgard, Oregon. This report documents the results of a timber survey project that was initiated in order to respond to Mt. Emily's application. It includes the following sections: a project map (in color, showing the boundaries of the examined area and delineation of 5 compartments within the Starkey Block); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. The report includes 21 tables summarizing the survey results by species, size class, compartment, etc. Appended to this descriptive report is a separate 4-page Cost Report, which has its own title page. The cost report includes the following sections: acreage and mileage; field expenses; field work; headquarters office work; and totals. The survey project area is now located within the Umatilla NF and the Wallowa-Whitman NF. The northeastern portion (shown as compartment 1 on the map) extended from west of Mt. Emily on the east (La Grande RD, Wallowa-Whitman NF) to Owsley Creek and upper Pelican Creek on the west (Walla Walla Ranger District, Umatilla NF). Most of the remainder of the survey area (the southwestern portion consisting of compartments 2-5) includes lands now administered by the La Grande RD, with the exception of a small tract located in the North Fork John Day RD that includes Bowman Spring.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Wallowa-Whitman NF/Umatilla NF/Walla Walla RD/North Fork John Day RD/La Grande RD.

460. **Matz, Fred A. 1928**. Descriptive report, Malheur River timber survey project, Malheur National Forest. Un-

published Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 108 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The area included in this survey was traversed by The Dalles Military Road, a grant for which was given on February 25, 1867. The route of that road was defined as The Dalles via Canyon City to Fort Boise, with a total length of 357 miles (35 of which are located within the survey area). The grant provided the recipient with the odd-numbered sections in a strip 3 miles wide on each side of the road, and further provided indemnity limits of 10 miles on each side of the road, once again for the odd sections. Since there was only 35 miles of the road in the survey area, but almost 86,000 acres of land patented under the grant, it was quite evident that a considerable acreage was acquired within the indemnity limits. Throughout the survey area, the lands patented as a result of the Road Grant were owned by the Eastern Oregon Land Company. They owned practically every other section of land and many of the original school grant sections. They desired for many years to dispose of the timber on their property, and issued grazing permits for their land, mostly to sheepmen. Since the grazing policy of the land company had a great bearing on the range program of the national forest, it was decided to complete a timber survey first, to be followed later with a forage or grazing survey. The land company entered into an agreement with the Forest Service whereby a timber cover-type survey would be completed for all lands within the survey area, with the survey of the company's land being reimbursed to the Service at a rate of 5 cents per acre. Forage survey maps would be provided to the company at an additional cost of 1 cent per acre. Most of the field work was completed during the 1927 field season, although a relatively small percentage of the total area was completed during 1928. This survey project included an area of 192,298 acres, of which 113,239 were national forest lands, 78,659 acres owned by Eastern Oregon Land Company, and 400 acres of other patented (private) land. Most of the survey area was located in the Malheur River and John Day River drainages; Prairie City, Oregon is located about 13 miles north of the survey area boundary. The Drewsey Road was the main north-south route through the survey area, with east-west roads leading from Crane Prairie to the North Fork of the Malheur River and from Summit Prairie west to Logan Valley. The report includes the following sections: two project maps (in color, showing the boundaries of the examined area, the portion of the project completed in 1927 and 1928, lands owned by the Eastern Oregon Land Company, other patented lands, Oregon state school lands pending patent, the boundary of an area designated to be covered for the Office of Grazing if time would permit, G.L.O. survey lines that were re-traced for control, and block and compartment boundaries); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. It also includes very many tables summarizing the survey results by species, size class, compartment, etc. Tables pertaining to national forest lands are separate from those for the Eastern Oregon Land Company. The report mentions that timber estimates and forest type information was recorded on blue-line maps at a scale of 4-inches-to-the-mile. Unfortunately, those maps were not included with this report or located elsewhere in the National Archives. Included with the descriptive report is a series of memoranda related to this timber survey project. Appended to this descriptive report is a separate 4-page Cost Report, dated December 15, 1928, which has its own title page. The cost report includes the following sections: acreage and mileage; field expenses; field work; headquarters office work; totals; and conclusion.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Malheur NF/John Day River/Malheur River.

461. **Matz, Fred A. 1931**. Descriptive report, Middle Fork John Day River timber survey project, Malheur National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 60 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The area included in this survey totalled 32,154 acres, of which 29,674 was public lands administered by the Forest Service. The survey stretched from Bum Canyon on the north to the Magone Lake area on the south, and included lands contained within four blocks: Camp Creek, Slide Creek, Beech Creek, and Long Creek. Long Creek, Oregon is located about 5 miles west of the survey area boundary; Fox is about 11 miles west of the area. The Oregon Lumber Company owned most of the patented timber land in the Camp Creek watershed and adjacent areas. That company had been cutting private and government timber in the head watershed of the Middle Fork of the John Day River for many years and it was understood that they were about cut out. They had stated a desire to extend their logging railroad on down the river to tap their holdings on Camp Creek in the Malheur NF. That company's holdings constituted about 50% of the entire acreage in the Camp Creek block. If the company's operations did shift to the Camp Creek area, it was expected that the government's intermingled timberland could be logged to best advantage at the same time as the company's land. Most of the government timber on the Whitman NF portion of the Middle Fork John Day River drainage was cruised in 1912 (see a report in the history archives entitled "Head watershed: Middle Fork John Day River; Whitman National Forest, Oregon" by Andrews and Merritt in 1910 for additional information on this area. The 1912 cruise was related to a reconnaissance survey completed by Hastings; a copy of that report has not been located). The Middle Fork John Day River project area, which was comprised of several different survey areas, included the portion of the river drainage that was not cruised in 1912. This survey

area adjoins another one to the north that was also cruised in 1930; it is described in a report authored by Matz in 1934. The field work for this project was completed in late summer and fall of 1930. The report includes the following sections: project map (in color, showing the boundaries of the examined area, patented land in an adjacent to the project, survey control lines that were established, G.L.O. lines that were retraced and control lines established thereon, and block boundaries); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. It also includes many detailed tables summarizing the survey results by species, size class, compartment, etc. In the silvicultural description section, it mentions that only small acreages of pure ponderosa pine occurred in the area, and that Douglas-fir and white fir were widely distributed with some western larch also present. The yellow pine type comprised 59% of the total survey area, ranging from a high of 66% in the Camp Creek block to a low of 28% in the Long Creek block. It was noted that dwarf mistletoe was present in the ponderosa pine and Douglas-fir, especially stands established on poorer sites, but that there was little mortality associated with bark beetles. Non-forest types in the survey area included hardwoods, juniper, mountain-mahogany, brush, grass, and barren areas. The report mentions that timber estimates and forest type information was recorded on blue-line maps at a scale of 4-inches-to-the-mile. Unfortunately, those maps were not included with this report or located elsewhere in the National Archives (although they may very well exist in the Archives in a record group that we did not have time to check). Included with the descriptive report is a separate 4-page Cost Report, dated November 14, 1931, which includes the following sections: acreage and mileage; field expenses; field work; headquarters office work; and summarized cost of project.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Malheur NF/Middle Fork John Day River/Whitman NF/Long Creek RD/Oregon Lumber Company.

462. **Matz, Fred A. 1934**. Descriptive report, Middle Fork John Day River timber survey project, Malheur National Forest. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 19 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The area included in this survey totalled 26,243 acres, of which 21,745 was public lands administered by the Forest Service. The survey area stretched from Putney Mountain and Little Indian Creek on the north to Mosquito Creek and an area south of Big Creek on the south. At least half of the survey area is now within the Umatilla National Forest (North Fork John Day Ranger District) with the remainder administered by the Malheur National Forest (Long Creek Ranger District). Long Creek, Oregon is located about 13 miles west (slightly southwest) of the survey area boundary. The Oregon Lumber Company owned most of the patented timber land in the Indian Creek watershed and adjacent areas. That company had been cutting private and government timber in the head watershed of the Middle Fork of the John Day River for many years and it was understood that they were about cut out. They had stated a desire to extend their logging railroad on down the river to tap their holdings on Camp Creek in the Malheur NF. That company's holdings constituted about 50% of the entire acreage in the Camp Creek block. If the company did shift their operations to the Camp Creek area, it was believed that the government's intermingled timberland could be logged to best advantage at the same time as the company's land. Most of the government timber on the Whitman NF portion of the Middle Fork John Day River drainage was cruised in 1912 (see a report in the history archives entitled "Head watershed: Middle Fork John Day River; Whitman National Forest, Oregon" by Andrews and Merritt in 1910 for additional information on this area. The 1912 cruise was related to a reconnaissance survey completed by Hastings; a copy of that report has not been located). This survey area included the portion of the river drainage that was not cruised in 1912. The Middle Fork John Day River project area, which was comprised of several different survey areas, included another area to the south that was also cruised in 1930; it is described in a report authored by Matz in 1931. The field work for this project was completed in late summer and fall of 1930. The report includes the following sections: maps (a project map in color, showing the boundaries of the examined area, the adjacent area covered in 1912, alienated lands, survey control lines that were established, and block boundaries); introduction; field work and computations; silvicultural description; logging data; statistical summary; and conclusion. It also includes many detailed tables summarizing the survey results by species, size class, compartment, etc. In the silvicultural description section, it mentions that only small acreages of pure ponderosa pine occurred in the area, and that Douglas-fir and white fir were widely distributed with some western larch also present. It was noted that dwarf mistletoe was present in the ponderosa pine and Douglas-fir, especially stands established on poorer sites, but that there was little mortality associated with bark beetles. The report mentions that timber estimates and forest type information was recorded on blue-line maps at a scale of 4-inches-to-the-mile. Unfortunately, those maps were not included with this report or located elsewhere in the National Archives (although they may very well exist in the Archives in a record group that we did not have time to check). Included with the descriptive report is a separate 4-page Cost Report, dated December 27, 1934, which includes the following sections: acreage and mileage; field expenses; field work; headquarters office work; and summarized cost of project.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Malheur NF/Middle Fork John Day River/Umatilla NF/Whitman NF/North Fork John Day RD/Long Creek RD/Oregon Lumber Company.

463. **McArdle, Richard E.; Meyer, Walter H.; Bruce, Donald**. **1949**. The yield of Douglas fir in the Pacific Northwest. Technical Bulletin No. 201. Washington, DC: U.S. Department of Agriculture. 74 p. **Size**: 6" x 9".
Notes: An original copy. The library also contains a reprint produced by Oregon State University book stores in 1979. This version is a revision of the original bulletin released in October 1930.
Abstract: This bulletin covers the following information as related to Douglas-fir forests west of the Cascade crest: the Douglas-fir region and its forests; growth characteristics of the forest; growth characteristics of the tree; factors influencing yield of Douglas-fir, including site quality and stocking; growth and yield tables, including "normal" yield tables; increment tables; stand tables; volume tables; and an appendix describing how the yield tables were made.
Keywords: Douglas-fir/Pacific Northwest/Timber yields/Historical document.

464. **McDougall, W. B. 1931**. Plant ecology. Philadelphia, PA: Lea & Febiger. 338 p. **Size**: 6" x 8".
Notes: An original copy of the second edition.
Abstract: While there were many valuable books on various phases of ecology, there was no single book in the English language that covered the subject in such a way that it could be used as a text in a comprehensive beginning course. The need for a textbook was recognized for some time but the very rapid growth of ecology as a new discipline resulted in a great deal of disagreement about certain rather fundamental principles and made the production of a widely applicable textbook almost impossible. This book was an attempt to meet the need for a textbook of plant ecology. It was based on a series of lectures that was given for several years to introductory ecology classes at the University of Illinois. The book was purposely made brief in order to be usable with a half-year ecology course with two lectures a week. References to recent ecological literature of that era are provided at the end of each chapter. An appendix provides suggestions concerning laboratory and field exercises that could support the study of ecology. This book includes the following chapters: introduction; the ecology of roots; the ecology of stems; the ecology of leaves; symbiosis–disjunctive; pollination; reciprocal nutritive disjunctive symbiosis; social conjunctive symbiosis; nutritive conjunctive symbiosis; physical factors: light; heat; air; soil; water; growth habits of plants; plant communities; the structure of plant associations; the classification of plant communities; plant succession; phenology; the distribution of plant communities; applied ecology; and an appendix. This book also contains an abundance of black-and-white photographs; the source of many of them was the U. S. Forest Service.
Keywords: Historical document/Forest influences/Plant communities/Plant ecology/Plant succession/Vegetation classification.

465. **Meagher, G. S. 1945**. Forest statistics for Linn County, Oregon. Forest Survey Report No. 95. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 23 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Linn County's forests in 1931-1932 and 1943. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; land use pattern; forest land; saw-timber volume; forest ownership; forest growth; forest depletion; forest industry; the forest situation summarized; and comparison of inventories. Area and volume tables are included throughout this report.
Keywords: Linn County OR/Forest inventory/Willamette NF/Historical document.

466. **Meinecke, E. P. 1916**. Forest pathology in forest regulation. Bulletin No. 275. Washington, DC: U.S. Department of Agriculture. 62 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This comprehensive, interesting bulletin describes the effects of forest pathogens on timber yields, and provides some recommendations for minimizing their effect on forest management. The concept of a pathological rotation is developed, and discussed specifically for white fir. Many of the underlying concepts are based on classical European literature, especially from Germany. It provides interesting insights about forest ecology, as illustrated with this quote: "...the assumption is that our forests today, having been untouched by man and exposed to the same factors of their surroundings since times immemorial, must represent more or less exactly the same character they had 100 or 1,000 years ago. But we have practically no genuinely virgin forests; in the great majority of commercial accessible stands, man has for centuries practiced some kind of primitive forestry by setting fires. This "Piute forestry" has changed the aspect of many stands so completely that the term "virgin forests" is far from being correctly applied. At best, one can speak of scattered virgin stands here and there."
Keywords: Tree diseases/Forest management/Historical document/Pathological rotation/White fir.

467. **Meinecke, E. P. 1929**. Quaking aspen: a study in applied forest pathology. Technical Bulletin No. 155. Washington, DC: U.S. Department of Agriculture. 33 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Describes the results of studies about the pathology of aspen, including the following topics: study objectives, principles, and methods; data analysis; and a discussion of study results. Estimates of timber yield losses attributable to decay and cankers is provided. Major causes of decay and timber loss are also described. The information contained in this bulletin is based on studies conducted Great Basin Range Experiment Station located in the Wasatch Mountains of Utah.
Keywords: Quaking aspen/Utah/Wasatch Mountains/Great Basin Range Experiment Station/Timber yields/Decays/Historical document.

468. **Merritt, M. L. 1916**. Yellow pine fire damage. Unpublished Typescript Report. Bend, OR: U.S. Department of Agriculture, Forest Service, Deschutes National Forest. 25 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: There was much conjecture among forest managers about the actual amount of damage done to yellow (ponderosa) pine by fires, even in cases where the fires were severe enough to kill much of the foliage. Many foresters believed that a majority of the yellow pines damaged in that way would normally recover. Since a 10,000-acre fire occurred on the Deschutes NF (it was locally referred to as the South Ice Cave Burn) in late summer (August 29 to September 14) of 1915, it was decided to conduct a study to obtain definite information about the mortality of yellow pine following a fire in which extensive crown scorch occurred. The primary objective of the study was to determine the extent of damage done to yellow pine timber by severe surface and crown fires, especially where all of the foliage was killed, and to determine an approximate mortality percentage for mature trees that have had all their foliage killed by fire. This document was a progress report for that study. It includes the following sections: purpose; use of results; place; assignment; methods; future work; report; and history of burn. Since it is a progress report, there are no conclusions and little discussion about the results of the study. Most of the document (17 pages) consists of a series of tables that describes every sample tree (100 such trees were selected on each of the three plots) on each sample plot. The plot tree summary tables included the tree number, the tree's diameter, the portion of the tree's foliage that was browned, the portion of the tree's bole that was blackened, and general notes about the tree. The "history of burn" section mentions an accompanying map, but none was present in the folder at the National Archives that contained this report.
Keywords: Fire effects/Historical document/Ponderosa pine/Deschutes NF/Central Oregon.

469. **Merritt, Melvin L. 1911**. Lodgepole pine in the Whitman National Forest. Unpublished Typescript Report. Sumpter, OR: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 18 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report was based on observations that the author made of the lodgepole pine type on the Whitman National Forest during the 1910 field season. Since they were based on only a single field season, the author was not certain that his conclusions would still be correct after a more extensive examination. The report includes the following sections: factors influencing the growth of lodgepole pine and related tree species (temperature, altitude, soil, light, moisture, reproduction habits, pure stands of lodgepole, areas not adapted to lodgepole, regions adapted to the growth of both lodgepole and other species); management (pure lodgepole stands, yellow pine stands, mixed conifer stands); and general conclusion. The report provides some silvical information, such as this ranking of tree species in terms of their ability to grow successfully in poor soils: yellow pine (most able), lodgepole pine, Douglas-fir, white fir, western larch, and Engelmann spruce (least able). The tolerance of tree species to low light (shade) was given as: Engelmann spruce (most tolerant of shade), white fir, Douglas-fir, lodgepole pine, western larch, and yellow pine (least tolerant). The author believed that the Whitman NF presented three situations with respect to lodgepole pine: sites better adapted to the growth of lodgepole pine than anything else; sites not adapted to the growth of lodgepole pine at all (yellow pine sites); and sites adapted to the growth of lodgepole pine and other species concurrently (mixed conifer sites). Merritt noted that the cones of lodgepole pine tended to open immediately upon maturing, indicating that the species was not serotinous on that Forest. It was noted that the most common situation supporting pure stands of lodgepole pine was damp, poorly-drained floodplains and benches along streams, although pure stands also occurred on flat ridges and gentle slopes at higher elevations (over 5,000 feet). About one-third to one-half of the Forest contained sites that were suitable for a mixed-conifer forest composition, in which lodgepole pine competed with larch, Douglas-fir, and white fir for growing space. Merritt noted that seedlings of the other species often got established concurrently with lodgepole following disturbance, but that lodgepole quickly outgrew them (except for the larch) and dominated the stand for a while. Eventually, though, the lodgepole would be overtaken by the more tolerant species after it reached its normal height growth. It seemed that the location and distribution of lodgepole pine on the Forest depended mostly on past fire history. The author's

conclusions include: the popular idea that yellow pine was the only valuable timber type in eastern Oregon was untenable; and the north slope type (mixed conifer type) was capable of producing a timber yield that would equal or surpass that produced by the yellow pine type, but only under proper management.
Keywords: Blue Mountains/Forest ecology/Forest management/Historical document/Silvics/Whitman NF/Lodgepole pine.

470. **Meyer, Walter H. 1934**. Growth in selectively cut ponderosa pine forests of the Pacific Northwest. Technical Bulletin No. 407. Washington, DC: U.S. Department of Agriculture. 64 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This comprehensive bulletin describes the results of a study to determine the growth rates and timber yields that can be expected in managed ponderosa pine forests of eastern Oregon and Washington. The following topics are discussed: cutting methods being used; study methods; factors influencing growth rates in selectively cut stands, including site quality, reserve volume, stand structure, residual spacing, stand composition, cutting cycle length, and mortality; predicting growth in selectively harvested stands; mortality; comparing conditions in extensive forests with those of the plot areas; and factors influencing growth of individual trees. Volume tables are provided in the appendix.
Keywords: Ponderosa pine/Pacific Northwest/Selective cutting/Volume tables/Timber yields/Eastern Oregon/Eastern Washington/Historical document.

471. **Meyer, Walter H. 1961**. Yield of even-aged stands of ponderosa pine. Technical Bulletin No. 630. Washington, DC: U.S. Department of Agriculture. 59 p. **Size**: 6" x 9".
Notes: An original copy. This publication is a slight revision of the original bulletin published in October, 1938.
Abstract: This bulletin covers the following topics as related to even-aged ponderosa pine stands in the western United States: the region and its ponderosa pine forests; yield tables; normal mortality; application of the yield tables; increment and rotation; stand and stock tables; height; volume; and an appendix describing the data available and methods used to construct the yield tables.
Keywords: Ponderosa pine/Timber yields/Western United States/Even-aged stands/Historical document.

472. **Mielke, J. L. 1943**. White pine blister rust in western North America. Bulletin No. 52. New Haven, Connecticut: Yale University, School of Forestry. 155 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This comprehensive bulletin describes white pine blister rust, a disease native to northern Asia that escaped from there and infected susceptible hosts in Europe and North America. In its native environment, the pathogen was relatively benign and innocuous; when exposed to new hosts in non-native areas, it became a virulent parasite of many important forest trees (primarily the white pines and other five-needled pines). This accession includes the following sections: introduction; origin of white pine blister rust; introduction to North America; white pines of western North America; the rust on pines; the rust on *Ribes*; scouting for the rust; early history of blister rust in the West; spread of the rust by years; general aspect of spread; disseminating agencies and spore stages involved; possible limits of long-distance spread; relation of weather to spread and intensification of the rust; wavelike character of spread of the rust; rate and direction of spread of the rust; some relations of *Ribes* species in the spread of the rust; pinon rust: its complications in the spread of blister rust; some biological factors unfavorable to development of the rust; strains of white pine blister rust; summary; acknowledgments; and references cited.
Keywords: Disease control/Disease surveys/Historical document/White pine blister rust.

473. **Miles, Herbert J. 1911**. Annual silvical report: Malheur National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 38 p.
Notes: A digital version of this report is available; filename: Malheur1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report includes the following sections: list of trees; list of shrubs; fundamental forest types (bottomland, slope, alpine, and transition types); general silvical descriptions by forest type; silvics of species; and silvical problems (subjects for special silvical studies which would be of value to this Forest). A variety of silvical characteristics are described for each species (habit, occurrence, soil and moisture, shade tolerance, growth and longevity, reproduction, susceptibility to injury, etc.). Many silvical characteristics are summarized for the 6 major tree species of the Malheur in a hand-written table.
Keywords: Historical document/Malheur NF/Blue Mountains/Silvics/Western white pine/Whitebark pine/Ponderosa pine/Lodgepole pine/Western larch/Engelmann spruce/Douglas-fir/Subalpine fir/Grand fir/White fir/Alaska yellow cedar/Western juniper/Pacific yew/Willows/Quaking aspen/Black cottonwood/Water birch/White alder/Thinleaf alder.

474. **Miller, J. M.; Patterson, J. E. 1927**. Preliminary studies on the relation of fire injury to bark-beetle attack in western yellow pine. Journal of Agricultural Research. 34 (7): 597-613.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article explores the relationship between fire and bark beetles that attack ponderosa pine trees. It was noticed early on that fire injuries, even those resulting from light ground fires, seemed to make certain ponderosa pines especially attractive to bark beetles, although the physiological basis for that attraction was unknown. The bulk of this article describes a study conducted in the mistletoe burn, a fire that occurred in the Siskiyou Mountains of southwestern Oregon in October of 1917. The following topics are discussed: introduction; the mistletoe burn; the Siskiyou burn; the chinquapin burn; effects of controlled burning upon bark-beetle infestations; and general summary.
Keywords: Bark beetles/Dendroctonus/Fire effects/Insect damage/Ponderosa pine/Southern Oregon/Western pine beetle/Historical document.

475. **Miller, James D. 1930**. Early Oregon scenes: a pioneer narrative. Oregon Historical Quarterly. 31 (March): 55-68.
Notes: A photocopy of an original.
Abstract: This article describes a family's preparations for, and actual emigration to, Oregon. They began their journey to Oregon on May 4, 1847, eventually arriving at Oregon City in the Willamette Valley in November after a journey of about 6 months. The balance of the article describes the journey, settling in the Oregon City area, a trip to the California gold fields, and other related matters. Although a good account of the emigration experience, this article does not provide many descriptions of early vegetation conditions.
Keywords: Oregon history/Willamette Valley/Oregon Trail/Historical document/Pioneer journals.

476. **Miller, John M. 1915**. Cone beetles: injury to sugar pine and western yellow pine. Bulletin No. 243. Washington, DC: U.S. Department of Agriculture. 12 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the damage caused by cone beetles (*Conophthorus* spp.) to ponderosa pine or sugar pine cones. When infested with beetles, the cones die soon after the start of the second growing season. Information about the cone beetle's life cycle is provided, as well as illustrations of cone beetle damage. Conditions requiring control of cone beetles, as well as suggested remedies, are also discussed.
Keywords: Cone insects/Ponderosa pine/Sugar pine/Historical document.

477. **Miller, L. C.; Clothier, George L.; Fetherolf, James M. No date**. Report of subcommittee no. XII: planting plans. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 19 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In the broadest sense, the objective of a planting plan is to furnish landowners with definite instructions as to the most economical and practical method of growing forest trees. This document describes planting plans; it was prepared by a subcommittee but there is no information in the report about the subcommittee's origin or its mission. The report includes the following sections: general object; classes of planting plans; forms of planting plan reports; field examinations; purpose of planting; examination of tract (general character, proposed planting sites, planting plan map); planted and natural timber; local conditions affecting tree growth; kind of stock, its source (stock from nurserymen, stock from home nurseries, stock from the forest); planting, time, and methods; protection and care of plantations; estimation of cost of formation; estimation of returns; application of plan; standard outline for field study; and planting plan studies and reports (desires and abilities of the applicant, general conditions of locality, natural tree growth, local conditions affecting tree growth, relation of planting sites to farm or tract, detailed site study, purpose and result of plantation, location of nursery site). Based on certain references in the text, it appears that this document was designed as a chapter in a larger text – perhaps a section of a handbook. It seems that subcommittees were formed and assigned specific topics (chapters?) for that purpose. References to other chapters include: forest maps; fire protection plans; and forest insects.
Keywords: Artificial regeneration/Historical document/Natural regeneration/Plantation protection/Planting/Seedling transplanting/Tree planting.

478. **Miner, Norman H.; Trappe, James M. 1957**. Snow interception, accumulation, and melt in lodgepole pine forests in the Blue Mountains of eastern Oregon. Research Note Number 153. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 4 p. **Notes**: An original copy.
Abstract: This study found that the largest volumes of snow accumulated in small natural openings. Thickets of tree reproduction intercepted snowfall that penetrated the overstory lodgepole pine. The ground remained bare all winter under the densest of these lodgepole pine stands. Small clearcuts in lodgepole pine forests, and thinning of dense reproduction, would result in a heavier snow pack and might serve to retard melt and prolong runoff in the

spring.
Keywords: Forest management/Forest influences/Historical document/Lodgepole pine/Precipitation/Runoff/Water yield/Watershed management/Snow interception/Snow accumulation.

479. **Minore, Don**. **1960**. Forest statistics for Grant County, Oregon. Forest Survey Report 137. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 29 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1958, of Grant County, which was initially inventoried in 1935-1936. The following topics were discussed: description of the county; significant findings of the forest inventory (land classification, commercial forest land area; commercial forest land timber volumes, forest ownership, log production); summary tables; forest survey procedure; accuracy of 1958 reinventory data; differences in results of inventories (1935-36 to 1958); definition of terms; and tree species. A generalized forest type map shows the location and distribution of forest types in the county. Fourteen tables of statistics are included.
Keywords: Forest inventory/Grant County OR/Historical document/Eastern Oregon/Umatilla NF/Malheur NF/ Ochoco NF/Wallowa-Whitman NF.

480. **Minto, John**. **1898**. A paper on forestry interests. Unnumbered Report. Salem, OR: State of Oregon, Oregon State Board of Horticulture. 24 p. **Notes**: A photocopy of an original.
Abstract: This report describes early forestry activities in Oregon. The amount of lumber cut, by county, is provided for 1897. Most of the report discusses grazing practices, the effects of forests on water relations, and a variety of other forest relationships. Very little detailed information is provided in this report; it primarily provides the author's opinions based on travels throughout the western United States and his membership in the American Forestry Association.
Keywords: Forest history/Historical document/Forest policy.

481. **Minto, John**. **1902**. Sheep husbandry in Oregon. The Quarterly of the Oregon Historical Society. 3 (3): 219-247.
Notes: A photocopy of an original.
Abstract: This interesting article provides a comprehensive history of the sheep industry in Oregon, going clear back to early sheep efforts by the Hudson Bay Company. The following topics are discussed: the pioneer era of domestic sheep husbandry; the era of expansion of sheep husbandry from the Cascades to the Rocky Mountains; conflicts for range; and the influence of sheep husbandry on human character.
Keywords: Grazing/Historical document/Oregon/Range management/Range history.

482. **Mlodziansky, A. K. 1898**. Measuring the forest crop. Bulletin No. 20. Washington, DC: U.S. Department of Agriculture, Division of Forestry. 71 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: An early bulletin covering the following topics: measurement of standing trees; measurement of felled trees; measurement of a stand of trees or growing stock of a forest; determination of growth rates; and a method for investigating timber growth, including the effects of aspect, soil and drainage conditions, physical properties of the soil and subsoil, and forest density.
Keywords: Historical document/Timber measurements/Tree growth.

483. **Moessner, Karl E.; Rogers, Earl J. 1957**. Parallax wedge procedures in forest surveys. Miscellaneous Publication No. 15 . Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 21 p. **Notes**: An original copy.
Abstract: The parallax wedge has often proved superior to much more expensive instruments for rapid estimation of tree heights from vertical aerial photographs. Since many foresters who tried to use the parallax wedge have been only partly successful, this paper explains and demonstrates certain fundamental techniques so that a forester can make effective use of this tool in interpreting vertical aerial photographs. It summarizes several important items published during the past dozen years and presents some new techniques for measurement. It also provides a few demonstration exercises designed to help the beginner become proficient in using the parallax wedge.
Keywords: Forest inventory/Parallax wedge/Aerial photography/Tree measurements/Historical document.

484. **Moravets, F. L. 1923**. Descriptive and cost report; McAllister Creek, Powwatka Ridge, and Wildcat Creek timber

survey projects, Wallowa National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, North Pacific District. 15 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The McAllister Creek survey area included 3,311 acres, which excludes private lands in the area. This survey area included all accessible Government timber on McAllister Ridge and was separated from the Mud Creek-Davis Creek timber sale on the east by the deep canyon of Mud Creek, and from the Powwatka Ridge survey unit on the west by the canyon of McAllister Creek. Of the total timber stand in the area, 40% was yellow pine, 35% was Douglas-fir, 14% western larch, and 10% white fir, with the remainder being small amounts of lodgepole pine and Engelmann spruce. The yellow pine occurred in widely scattered stands along the ridges and on dryer eastern and southern exposures. Stands comprised of larch and Douglas-fir covered the majority of the survey area, generally upon northern exposures and in the draws. They had relatively equal amounts of western larch and Douglas-fir, with small amounts of white fir in the draws. The timber was not deteriorating rapidly and could safely be held until a more favorable lumber market existed. The McAllister Creek report includes the following sections: introduction; a project map (in color, showing the boundaries of the examined area and patented (private) lands); status and ownership; silvical description; logging data; description of cruise; and tables. The report includes a decimal "C" volume table for Douglas-fir, white fir, lodgepole pine, and Engelmann spruce (all four species in one table), and four tables summarizing the survey results by township and range. The Powwatka Ridge and Wildcat Creek report includes the following sections: location and acreage; description of cruise; silvical description, logging data, and management; and volume tables. It also includes three tables summarizing survey results by township and range. There is also a table comparing timber volume estimates from the Powwatka Ridge timber survey of 1920 (see Conover 1920 in the history archives for a description of that earlier survey) with the survey completed in 1923 and described in this report. Following the descriptive reports is a 3-page Cost Report that includes the following sections: field work; office work; and total costs.
Keywords: Blue Mountains/Forest inventory/Historical document/Timber sales/Wallowa-Whitman NF/Wallowa NF/Powwatka Ridge/McAllister Creek/Wildcat Creek.

485. **Moravets, F. L. 1953**. Forest statistics for Clark County, Washington. Forest Survey Report No. 108. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 25 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1949, of Clark County, which was initially inventoried in 1931. The following topics were discussed: foreward; significant survey findings in the forest inventory (land use, forest land, timber volume, forest ownership); forest survey procedure; sampling accuracy; comparison of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; poletimber, seedlings, and saplings; recent clearcuts and nonstocked areas; old nonstocked cutovers and burns; noncommercial forest; and nonforest). Eleven tables of statistics are included.
Keywords: Forest inventory/Historical document/Clark County WA/Lewis River/Vancouver WA.

486. **Moravets, F. L. 1953**. Forest statistics for Grays Harbor County, Washington. Forest Survey Report No. 111. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 24 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1951, of Grays Harbor County, which was initially inventoried in 1932. The following topics were discussed: foreward; significant findings in the forest inventory (land use, forest land, timber volume); forest survey procedure; accuracy of data; comparison of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; poletimber, seedlings, and saplings; recent clearcuts and nonstocked areas; old nonstocked cutovers and burns; noncommercial forest; and nonforest). Eleven tables of statistics are included.
Keywords: Forest inventory/Historical document/Grays Harbor County/Olympic NF/Olympic National Park/Quinault Indian Reservation.

487. **Moravets, F. L. 1936**. Forest statistics for Harney County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 12 p.

Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Harney County's forests completed in 1935. A small-scale map showing the distribution of forests, juniper woodlands, and nonforest areas is also included. The following topics are discussed: location and description of the county; the nonforest zone; the juniper woodland zone; forest types; ownership of forest land; volume and ownership of merchantable timber; insect damage; and economic development. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Malheur NF/Ochoco NF/Historical document/Harney County OR.

488. **Moravets, F. L. 1954**. Forest statistics for Harney County, Oregon. Forest Survey Report No. 118. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 23 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1953, of Harney County, which was initially inventoried in 1935. The following topics were discussed: significant findings of the forest inventory (land classification, timber volume, forest ownership, forest utilization); forest survey procedure; accuracy of reinventory data; differences in results of inventories (1935 to 1953); and definition of terms. A map shows the location and distribution of forest stand-size and condition classes in the county. Eleven tables of statistics are included.
Keywords: Forest inventory/Harney County OR/Eastern Oregon/Historical document/Malheur NF/Ochoco NF.

489. **Moravets, F. L. 1954**. Forest statistics for Jefferson County, Oregon. Forest Survey Report No. 115. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 23 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1953, of Jefferson County, which was initially inventoried in 1934. The following topics were discussed: foreward; significant findings in the forest inventory (land use, timber volume); forest survey procedure; accuracy of data; comparison of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (uncut sawtimber; selectively cut sawtimber; poletimber and seedlings and saplings; nonrestocked burns; noncommercial forest; and nonforest). Eleven tables of statistics are included.
Keywords: Forest inventory/Historical document/Jefferson County OR/Deschutes NF/Warm Springs Indian Reservation.

490. **Moravets, F. L. 1941**. Forest statistics for Kitsap County, Washington. Forest Survey Report No. 82. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 12 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Kitsap County's forests in 1933 and 1940. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; major land uses; forest cover; productive capacity of forest sites; saw-timber volume; ownership of forest resources; forest depletion; forest growth; comparison of inventories; and conclusions. Area and volume tables are included throughout this report.
Keywords: Kitsap County WA/Forest inventory/Historical document.

491. **Moravets, F. L. 1954**. Forest statistics for Kittitas County, Washington. Forest Survey Report No. 117. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 24 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and

the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1953, of Kittitas County, which was initially inventoried in 1935. The following topics were discussed: foreward; significant findings in the forest inventory (land classification, timber volume, forest ownership, timber utilization); forest survey procedure; accuracy of reinventory data; difference in results of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (uncut sawtimber; selectively cut sawtimber; poletimber and seedlings and saplings; nonrestocked burns; noncommercial forest; and nonforest). Eleven tables of statistics are included.
Keywords: Forest inventory/Historical document/Kittitas County WA/Snoqualmie NF/Wenatchee NF.

492. **Moravets, F. L. 1947**. Forest statistics for Klamath County, Oregon. Forest Survey Report No. 99. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 28 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Klamath County's forests in 1934 and 1945-1946. A small-scale map showing the distribution of saw timber, selectively cut areas, second growth, old nonrestocked cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of the county; nonforest land; forest land; forest ownership; forest growth; forest depletion; forest industry; forest situation analyzed; and comparison of inventories. Area and volume tables are included throughout this report.
Keywords: Klamath County OR/Forest inventory/Historical document/Fremont NF/Deschutes NF/Klamath Indian Reservation/Rogue River NF/Crater Lake National Park.

493. **Moravets, F. L. 1950**. Forest statistics for Lake County, Oregon. Forest Survey Report No. 102. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 19 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1947, of Lake County, which was initially inventoried in 1934-35. The following topics were discussed: foreward; survey findings in brief; forest survey procedure; comparison of inventories; reliability of the statistics and forest type map; and explanation of terms used. A map shows the location and distribution of generalized forest types in the county (virgin sawtimber; partially cut sawtimber; young growth; nonrestocked cutovers and burns; noncommercial forests; and nonforest). Ten tables of statistics are included.
Keywords: Forest inventory/Historical document/Lake County OR/Deschutes NF/Fremont NF.

494. **Moravets, F. L. 1943**. Forest statistics for Lane County, Oregon. Forest Survey Report No. 92. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 23 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Lane County's forests in 1932 and 1942. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; extent and character of forests; productive capacity of forest land; volume of merchantable timber; forest ownership; forest utilization; forest depletion; forest growth; and present and future aspects of forest situation. Area and volume tables are included throughout this report.
Keywords: Lane County OR/Forest inventory/Historical document/Siuslaw NF/Willamette NF/Umpqua NF.

495. **Moravets, F. L. 1953**. Forest statistics for Lewis County, Washington. Forest Survey Report No. 112. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 24 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and

the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1952, of Lewis County, which was initially inventoried in 1931. The following topics were discussed: foreward; significant findings in the forest inventory (land use, forest land, timber volume); forest survey procedure; accuracy of data; comparison of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; poletimber and seedlings and saplings; recent clearcuts and nonstocked areas; old nonstocked cutovers and burns; noncommercial forest; and nonforest). Eleven tables of statistics are included.
Keywords: Forest inventory/Historical document/Lewis County WA/Gifford Pinchot NF/Mount Rainier National Park/Snoqualmie NF.

496. **Moravets, F. L. 1944**. Forest statistics for Lincoln County, Oregon. Forest Survey Report No. 93. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 20 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Lincoln County's forests in 1931-1932 and 1942. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; forest land; volume of merchantable timber; forest ownership; forest utilization; forest depletion; forest growth; and the forest situation summarized. Area and volume tables are included throughout this report.
Keywords: Lincoln County OR/Forest inventory/Historical document/Siuslaw NF.

497. **Moravets, F. L. 1941**. Forest statistics for Mason County, Washington. Forest Survey Report No. 86. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 20 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Mason County's forests in 1932 and 1940. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; the original forest; the present forest; nonforest land; saw-timber volume; utilization of the forest resource; other depletion; forest growth; comparison of inventories; and summary of situation. Area and volume tables, and bar charts, are included throughout this report.
Keywords: Mason County WA/Forest inventory/Olympic NF/Olympic National Park/Historical document.

498. **Moravets, F. L. 1947**. Forest statistics for Multnomah County, Oregon. Forest Survey Report No. 98. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 15 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Multnomah County's forests in 1931 and 1946. A small-scale map showing the distribution of saw timber, second growth, recent cutovers, old nonrestocked cutovers and burns; and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of the county; classification of forest land; productive capacity of forest land; timber volume; forest ownership; forest depletion; forest growth; and forest management. Area and volume tables are included throughout this report.
Keywords: Multnomah County OR/Forest inventory/Historical document/Mt. Hood NF.

499. **Moravets, F. L. 1942**. Forest statistics for Skagit County, Washington. Forest Survey Report No. 88. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 18 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present con-

sumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Skagit County's forests in 1934 and 1941. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physiography of the county; the original forests; the present forests; and the future forests. Area and volume tables, and bar charts, are included throughout this report.
Keywords: Skagit County WA/Forest inventory/Mt. Baker NF/Historical document.

500. **Moravets, F. L. 1952**. Forest statistics for Wahkiakum County, Washington. Forest Survey Report No. 106. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 23 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1949, of Wahkiakum County, which was initially inventoried in 1931. The following topics were discussed: foreward; significant survey findings; forest survey procedure; accuracy of data; comparison of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; young growth; recent clearcuts and nonstocked areas; old nonstocked cutovers and burns; and nonforest). Eleven tables of statistics are included, as are nine pie charts.
Keywords: Wahkiakum County WA/Forest inventory/Historical document/Grays River.

501. **Moravets, F. L. 1940**. Forest statistics for Washington County, Oregon. [Unnumbered Report]. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 16 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Washington County's forests in 1930 and 1940. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; forest zone; agricultural zone; recapitulation of type area and timber volume statistics; utilization of forests; and management of forest land. Area and volume tables, and bar charts, are included throughout this report.
Keywords: Washington County OR/Forest inventory/Historical document.

502. **Moravets, F. L. 1937**. Forest statistics for Wheeler County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 15 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Wheeler County's forests that was completed in 1936. A small-scale map showing the distribution of forests, juniper woodlands, and nonforest areas is also included. The following topics are discussed: location and description of the county; the nonforest zone; the juniper woodland zone; the forest zone; forest type acreages; site quality of forest land; ownership of forest land; volume and ownership of merchantable timber; and economic development. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Umatilla NF/Ochoco NF/Wheeler County OR/Historical document.

503. **Moravets, F. L. 1955**. Forest statistics for Wheeler County, Oregon. Forest Survey Report No. 119. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 23 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1953, of Wheeler County, which was initially inventoried in 1936. The following topics were discussed: significant findings of the forest inventory (land

classification, timber volume, forest ownership, forest utilization); forest survey procedure; accuracy of reinventory data; difference in results of inventories (1936 to 1953); and definition of terms. A map shows the location and distribution of forest stand-size and condition classes in the county. Eleven tables of statistics are included.
Keywords: Forest inventory/Wheeler County OR/Eastern Oregon/Historical document/Umatilla NF/Ochoco NF.

504. **Moravets, F. L. 1943**. Forest statistics for Yamhill County, Oregon. Forest Survey Report No. 91. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 15 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Yamhill County's forests in 1930 and 1942. A small-scale map showing the distribution of saw timber, second growth, deforested cutovers and burns, and noncommercial forests and nonforest land is also included. The following topics are discussed: foreword; physical character of county; character of the forests; productive capacity of forest land; merchantable volume; forest ownership; forest utilization; growth; and present and future aspects of forest situation. Area and volume tables are included throughout this report.
Keywords: Yamhill County OR/Forest inventory/Historical document/Siuslaw NF.

505. **Morrill, George E. 1946**. Forest statistics for Marion County, Oregon. Forest Survey Report No. 96. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 21 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Marion County's forests in 1930 and 1944. A small-scale map showing the distribution of saw timber, second growth, recent cutovers, old nonrestocked cutovers and burns; and noncommercial forests and nonforest land is also included. The following topics are discussed: highlights; foreword; history and development of the county; forest land; saw-timber volume; forest ownership; forest depletion; forest industries; forest growth; comparison of inventories; and summary. Area and volume tables are included throughout this report.
Keywords: Marion County OR/Forest inventory/Historical document/Mt. Hood NF/Willamette NF.

506. **Morris, William G. 1934**. Lightning storms and fires on the national forests of Oregon and Washington. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 27 p. **Notes**: A photocopy of an original.
Abstract: Lightning caused more than one half of all the fires on the national forests of Oregon and Washington, with at least 750 fires per year being attributed to that cause. Since lightning storms, and the fires they cause, cannot be prevented, this report was designed to improve the preparedness for such fires by providing the following information: where lightning storms occur most frequently, where and under what conditions they are most likely to start fires, how those fires behave, and when the most dangerous storms may be expected. At the time this study was conducted, the Forest Service had the most complete database of mountain lightning storm occurrence. An analysis of those records was the basis for this report, which includes the following sections: data and analyses; basic data; mapping the reports; subregions; types of storm days; relation of type of storm day to number of lightning fires; lightning storm paths and "breeding" spots; localities in which series of storm days originated; lightning storm zones; lightning fire zones; mapping zones of fire frequency; lightning fire frequency at different altitudes; relative importance of various materials as kindling for lightning fires; rating lightning fire danger in different parts of a national forest; seasonal distribution of lightning fires; characteristics of lightning storm occurrence, behavior, and movement in Oregon and Washington; simultaneous occurrence over great areas; time of lightning storm occurrence; length of lightning storms; rate of lightning storm movement; direction of lightning storm movement; relative number of lightning flashes confined to the clouds; and summary. This report contains many interesting graphs, tables, and maps.
Keywords: Forest fires/Lightning/Lightning-caused fires/Pacific Northwest Region/Oregon/Washington/Historical document.

507. **Morrison, Frank B. 1951**. Feeds and feeding; a handbook for the student and stockman. Ithaca, New York: The Morrison Publishing Company. 1207 p. **Size**: 6" x 9".
Notes: An original copy of the twenty-first edition, fifth printing.

Abstract: The purpose of this book is to present the most important facts concerning the nutrition, feeding, care, and management of the various classes of farm animals. It also provides information about the composition, use, and value of all important feed stuffs. Part 1, which consists of 12 chapters, emphasizes the fundamental principles of animal nutrition. Part II, comprising the next 12 chapters, covers the composition, properties, and use of important feeding stuffs. Part III, consisting of chapters 25 through 37, presents important facts concerning the nutrition, feeding, care, and management of the various classes of livestock. An appendix includes 10 tables of reference-type information (vitamin content in important feeding stuffs, etc.) and an index.
Keywords: Cattle grazing/Grazing/Historical document/Livestock forage/Range management/Sheep grazing/Livestock feeds.

508. **Morsell, W. F. 1897**. The survey of the forest reserves. Science. 6 (149 (Nov. 5)): 694-695.
Notes: A photocopy of an original.
Abstract: This short article describes the early survey work of nine forest reserves in the western United States. The responsibility for survey of the forest reserves was assigned to the Geological Survey. The survey work entailed establishment of topographic base lines, delineation of all forested and wooded areas, and erection of benchmarks at several points in each reserve. They were attempting to generate topographic maps at a scale of 2 miles to the inch and with 100-foot contours. Economic investigations were headed up by Henry Gannett, along with seven forestry experts. Gannett's division was collecting information on timber conditions, undergrowth density, fire history, timber harvest history and extent, location of lands most valuable for non-timber purposes, status of settlement within the reserves, and the demand for timber in the vicinity of the reserves.
Keywords: Forest history/Forest mapping/Forest reserves/Historical document.

509. **Mosgrove, Jerry L. 1980**. The Malheur National Forest: an ethnographic history. Unnumbered Report. John Day, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Malheur National Forest. 253 p.
Notes: A photocopy of an original.
Abstract: This report briefly describes the prehistory and history of the Forest area, while Malheur National Forest history has been examined in greater depth. The report synthesizes published historical material, unpublished data in the Malheur Forest files and museum archives, and information gathered from personal interviews. Examination and description of Forest history has been confined to a period through 1940. The following topics are discussed: environmental setting, ethnography, general history, the military, and forest history. The report contains copious maps and photographs.
Keywords: Forest history/Malheur NF/Ethnography.

510. **Mounts, J. 1972**. Summary tables pertaining to a Douglas-fir tussock moth outbreak, 1972 and 1973. Unpublished Typescript Table. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 3 p. **Notes**: An original copy.
Abstract: This accession consists of three tables that summarize the effects of a Douglas-fir tussock moth (DFTM) outbreak on the Umatilla NF and other areas in Oregon and Washington. The first page is a table entitled "Summary of Douglas-fir tussock moth infestations in developed roadless areas 5,000 acres and larger, 1972." It summarizes acreages for three categories of defoliation class (tree kill; top kill; defoliation), total infested acres, total acres in the Roadless area, and the percent of each area infested. Data is provided for 14 roadless areas (Spangler, Upper Tucannon, Asotin Creek, Hogback, Wenatchee Creek, Saddle Creek, Moore Flat, Mill Creek Watershed, Timothy, Walla Walla River, Grand Ronde, North Fork Umatilla River, Hellhole, and Wenaha Backcountry). Totals for roaded areas on the Forest are also provided for the three defoliation classes and the total infested acres columns, thereby providing a contrast between roaded and roadless areas. Grand totals for the whole Forest are provided for those four columns. The second page is a table entitled "Summary of Douglas-fir tussock moth infestations in developed roadless areas 5,000 acres and larger, 1973." It provides similar information as the first table in an identical format, but pertains to 1973 instead of 1972. Since this accession is dated 1/9/72, it is assumed that the figures in the second table are estimates. The third table is entitled "Douglas-fir tussock moth projections for 1973" and includes four columns of information: area; class I acres; class II & III acres; and total acres. The areas included in this table are the Blue Mountains (Wallowa-Whitman NF, Umatilla NF, State and Private); Wenatchee (Wenatchee NF, State and Private); Okanogon (State and Private); Lincoln County Washington (State and Private); and Colville Indian Reservation Washington. This table showed that 433,890 acres were being considered for control (spraying) treatments, at a projected cost of $1,695,496.
Keywords: Blue Mountains/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/Umatilla NF/Wallowa-Whitman NF/Wenatchee NF/Roadless areas.

511. **Mowat, Edwin L. 1954**. Effect of thinning and pruning on growth of young ponderosa pine. Northwest Science.

28 (1): 18-25. **Notes**: An original copy.
Abstract: Interest in thinning of young ponderosa pine has fluctuated widely since foresters first considered its possible application some thirty to forty years ago. It was never applied on more than a small scale or trial basis until the Civilian Conservation Corps program from 1933 to 1940. Pruning to improve stem quality is a more recent development in ponderosa pine. Considerable pruning was also done during CCC days, but the practice has had a steadier growth since then.
Keywords: Forest management/Historical document/Ponderosa pine/Precommercial thinnings/Silviculture/Pruning.

512. **Mowat, Edwin L. 1949**. Preliminary guides for the management of lodgepole pine in Oregon and Washington. Research Note No. 54. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station . 10 p. **Notes**: An original copy.
Abstract: Research in the Pacific Northwest region has included a study of the ecology of the type, a little work on volume tables, a few test thinnings in young stands on the Wallowa and Whitman National Forests and on the Pringle Falls Experimental Forest, and a limited survey, made by the Experiment Station in 1947, of partial cuttings. The purpose of this note is to summarize results of these studies and to outline management practices that appear advisable. Some information from the Rocky Mountain region that seems to apply generally to lodgepole pine is also used.
Keywords: Lodgepole pine/Silvicultural systems/Oregon/Washington/Historical document/Precommercial thinnings.

513. **Mowat, Edwin L. 1961**. Supplement to growth after partial cutting of ponderosa pine on permanent sample plots in eastern Oregon. Research Paper 44 (Supplement). Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 28 p. **Notes**: A photocopy of an original.
Abstract: This document is a supplement to research paper 44. It describes in detail each of the seven series of ponderosa pine methods-of-cutting study plots that are summarized in the research paper. Copious information about site characteristics, stand characteristics and treatment history, cutting methods tested, board-foot growth and mortality data, and results as related to stand conditions and cutting method are provided for each of the study areas. The study areas described are the Whitman National Forest plots (now administered by the Malheur National Forest), which were installed in 1913; the John Day Experimental Forest plots, established in 1936; the Malheur National Forest plots, established in 1927 and 1930; Malheur National Forest plots 8A and 8B, established in 1938; Rogue River National Forest plots, established in 1927; Deschutes National Forest plots, established in 1927 and 1929; and Pringle Falls Experimental Forest plots, established in 1936.
Keywords: Eastern Oregon/Forest management/Historical document/Second-growth stands/Silviculture/Malheur NF/Wallowa-Whitman NF/Deschutes NF/Rogue River NF.

514. **Mowat, Edwin L. 1953**. Thinning ponderosa pine in the Pacific Northwest: a summary of present information. Research Paper No. 5. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 24 p. **Notes**: An original copy.
Abstract: Proper thinning of dense, young stands of ponderosa pine increases the growth rate of remaining trees and thereby shortens the time required to grow timber of a desirable size. The extent of improvement in growth is shown by thinning studies in the Pacific Northwest covering periods of 10 to 24 years. These studies, together with general experience and research in other pine regions, are summarized in this paper. The discussion is largely confined to stands of commercial size, which means stands not yet producing saw logs at least 8 inches in diameter.
Keywords: Ponderosa pine/Precommercial thinnings/Stand density/Forest management/Historical document/Pacific Northwest.

515. **Mulford, F. L. 1920**. Street trees. Bulletin No. 816. Washington, DC: U.S. Department of Agriculture. 58 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This early bulletin describes the importance of shade trees, primarily by discussing the following topics: public control of street trees; planning for street trees; spacing and growing conditions; suitability of certain kinds of trees for street use; suitable trees for various regions of the country; trees for special purposes; cultural practices for street trees, including species selection, planting, pruning, staking, and long-term care; and the pruning, feeding, and spraying of mature street trees.
Keywords: Arborculture/Shade trees/Historical document.

516. **Munger, T. T. 1909**. Annual report of the section of silvics, District VI. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 3 p.

Notes: A digital version of this report is available; filename: Silvics1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes studies initiated or continued by the Section of Silvics after the establishment of a District Office in Portland. The following studies or projects were mentioned: "the encroachment of lodgepole pine on western yellow pine on the east slopes of the Cascade Mountains in Oregon" (recommends forms of management to be used for the yellow pine and lodgepole pine types, and identifies that extensive artificial reforestation is needed in many poorly forested areas in those types); an extensive study of Douglas-fir on the west side of the Cascades in Oregon and Washington; an effort to bring all of the records pertaining to cut-over areas up to date for every national forest (in 1909, it was already seen that these records were being neglected, and that training and an emphasis on them were going to be needed to have them kept up sufficiently); the Forests were cooperating in the establishment of meteorological stations; and a study of Cascara (*Rhamnus purshiana*) conducted by Professor Jepson.
Keywords: Historical document/Forest management/Oregon/Washington/Program administration.

517. **Munger, T. T. 1911**. Annual report to the forester, section of silvics – District VI. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 20 p.
Notes: A digital version of this report is available; filename: Silvics2. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes the following silvicultural studies or projects that were initiated or ongoing during 1910-1911: Douglas fir study (included areas west of the Cascades); yellow pine study (covered entire range in Oregon; study initiated during field season of 1910 and eventually published in 1917 as "Western Yellow Pine in Oregon" (see USDA Bull. 418); sand dune study (dunes on the Siuslaw NF); avalanche study (covered Cascades in Washington); permanent sample plot installation (3 plots established in pure Douglas-fir stand, 54-years old, on the Umpqua NF); Douglas-fir cut-over study (established in the Wind River Valley area); brush disposal experiments (mostly involving the yellow pine type); surface fire experiments (examines fire effects of surface fires on 6 Forests in both western and eastern Oregon); insect infestation investigations (reconnaissance surveys of the entire Blue Mountains area and Deschutes NF, and description of beetle control work initiated in fall of 1910); western red cedar study; experimental sowing and planting (studies begun on the Wallowa and Wenatchee NFs); herbarium, library, computing clerk, and lectures at forestry schools; tax study; clover fire line experiment; annual silvical reports (prepared and submitted by each national forest in the District); special reports; and standardization of tree measurements.
Keywords: Historical document/Program administration/Oregon/Washington/Forest management.

518. **Munger, T. T. 1912**. Annual silvical report; District VI. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 19 p.
Notes: A digital version of this report is available; filename: Silvics3. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes the following studies or projects that were initiated or continued during 1911-1912: yellow pine study (continuation); Douglas fir study (continuation); red cedar study (continuation); sand dune control (continuation); fire damage study (continuation); insect control operations (continuation of bark beetle control on 84,000 acres on the east side of the Whitman NF); avalanche study (continuation); silvical examination of timber on the Malheur NF (a survey of the general health and condition of mature yellow pine forest on a large portion of the Malheur NF); brush disposal experiment (continuation); effect of sheep grazing on yellow pine reproduction; study of cut-over areas (continuation); permanent sample plots (continuation, with additional plots established on the Siuslaw and Crater NFs); tax study in Washington (continuation); herbarium, library, computing, annual silvical reports (continuation); experimental sowings and plantings (continuation); and a description of upcoming work, including a streamflow study planned for the Whitman NF near the Blue Mountain Ranger Station at the headwaters of the John Day River.
Keywords: Historical document/Program administration/Oregon/Washington/Forest management.

519. **Munger, T. T. 1912**. The future yield of yellow pine stands in Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 33 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: A silvical study of western yellow pine (ponderosa pine) was made in the summers of 1910 and 1911 in eastern Oregon. The principal objectives of the study were to determine 1) the future yield of yellow pine stands that were harvested using the selection system; 2) the factors which have the most influence on yellow pine volume yield; and 3) the comparative yield associated with various cutting cycle lengths. The study was extensive and collected a large amount of data, consisting of stump analysis for 5,700 trees and the measurement of many sample

plots aggregating 1,019 acres in typical yellow pine stands of central and eastern Oregon. This report focuses on the future yields of yellow pine stands as based on an analysis of the collected data. It includes the following sections: method of preparing the tables; analysis of tables; description of each tract; and conclusions. Most of the report consists of tables that were prepared for each of the primary sample areas. Sample areas ("tracts") located in the Blue Mountains included Crawford Creek near Austin (Malheur NF), Austin & Whitney (Malheur NF, Wallowa-Whitman NF?), Lookingglass Creek (Umatilla NF), and Winlock's Mill (near Umatilla NF, Heppner RD). The yellow pine study described in this report formed the basis for several other publications, such as George Bright's growth study (see Bright 1912) and Munger's definitive, landmark bulletin called "Western Yellow Pine in Oregon" (1917). Both of those publications are also contained in the history archives.
Keywords: Blue Mountains/Heppner RD/Historical document/Lookingglass Creek/Malheur NF/Ponderosa pine/Timber volume/Timber yields/Umatilla NF/Wallowa-Whitman NF.

520. **Munger, T. T. 1909**. Notes on brush disposal in eastern Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 7 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: It is noted on this report that it was prepared for the Society of American Foresters and was not published. The report pertains to a recent trip that the author made across central Oregon in which he made notes about the methods of brush disposal that seem to be suited to the various regions he visited. The two methods that were considered applicable were 1) piling and burning; and 2) lopping and scattering. The general conclusion he reached is that conditions are so variable in the yellow pine region of eastern Oregon that neither of those methods could be recommended to the exclusion of the other. Munger believed that the decision as to which method to use should be made by the Forest officer on the ground, although the officer's recommendation should be based on these general principles: 1) in dry regions, yellow pine reproduction is usually better where brush or some other ground covering is available to conserve soil moisture; 2) in regions where livestock grazing was abundant, brush could be helpful for protecting them from trampling and browsing damage; 3) the presence of dry brush increases the risk and severity of forest fires; and 4) the presence of logging debris may help to increase the number of bark beetle attacks by serving as brood sites. The author also felt that burning the brush (broadcast) could be detrimental in mixed stands, especially on the yellow pine/lodgepole pine mixtures prevalent in central and south-central Oregon because it would favor lodgepole over yellow pine. One of the places that Munger visited was the Heppner division of the Umatilla National Forest. He noted that where soils were deep and forest conditions were well established, that natural reproduction of western larch and yellow pine were very good – dense thickets of seedlings or small saplings were common. That situation was particularly common on the north side of the divide (the main east-west ridge system of the Heppner Ranger District). To leave brush unburnt on that portion of the Heppner division would not only be unnecessary from a regeneration standpoint, but would constitute a serious fire hazard that could jeopardize long-term survival of the advance reproduction. Munger also provides notes about the area along the base of the Cascades from Bend to the Klamath Indian Agency, and for the Fremont National Forest area.
Keywords: Slash treatment/Ponderosa pine/Eastern Oregon/Broadcast burning/Historical document/Logging residue/Heppner RD/Fremont NF/Klamath Indian Reservation/Umatilla NF/Lop-and-scatter slash treatment.

521. **Munger, T. T. 1912**. Notes regarding increased growth in yellow pine stands as the result of a selection cutting. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 6 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes a partial cutting in a western yellow pine stand located a short distance south of Odessa, on the Crater National Forest. The stand was selectively harvested about 24 years ago when the largest trees were removed, leaving younger "bull" pines and mature trees that were defective or otherwise not desired by the loggers. The cutting resembled those currently being done in National Forest timber sales except that the reserve trees were suppressed or defective. This report supplements a previous one authored by Forest Assistant Foster and entitled "Silvicultural Aspect of Cutting in Open Yellow Pine Forest." The author of this report collected additional data from the area on May 16, 1912, which forms the basis for this report. One square acre in the old cutting was delineated, and all the trees upon it were calipered (diameters measured) and tallied according to their present crown class and their probable crown class before the cutting. A Mattson increment borer was then used to remove an increment core from each tree over 9 inches in diameter. Analysis of the cores was presented in table 1, which shows the increment associated with 14 sample trees (they were all of the trees over 9" DBH on the entire sample acre) for 60 years before the year in which the sample was collected. In addition to the 14 trees over 9" DBH, the sample acre contained 2,750 seedlings less than 12 feet tall, most of which were yellow pine, 3 to 6 feet tall, and 15 to 20 years old. Munger then analyzed basal area growth, which was .11 square feet per tree per half-decade for the last 20 years before the sample, whereas it was only .0675 before the cutting. In other words, the basal area growth, and presumably the volume growth, was 63 percent greater following the selective harvest.

Munger believed that the increase would have been greater if the treatment had been a silvicultural entry rather than a logger's choice. A further study along the same lines was made at the same time on an adjacent area included within a Forest Service timber sale logged seven years before this report was prepared. Munger sampled seven of the reserve trees in that area and their increment data are presented in table 3. Analysis of the increment data from those 7 trees showed a modest increase of 17 percent in the seven years since the cutting occurred. The conclusions reached in this small study are: 1) after a selection cutting is made in western yellow pine, a large increase in basal area growth is to be expected; 2) although the number of sampled trees was small, the increase in growth seems to occur in both large and small trees; and 3) the stocking of a normal yellow pine forest, in spite of its openness, does not provide the average tree with enough growing space for maximum growth.
Keywords: Ponderosa pine/Timber yields/Historical document/Crater NF/Cutover areas/Diameter growth/Maturity selection system/Selective cutting/Southern Oregon.

522. **Munger, T. T. 1911**. Outline for silvical study of western yellow pine in Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 7 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document outlines the 1911 plan of work for a detailed study of western yellow pine that had begun in 1910. The 1911 sampling was to be concentrated in parts of eastern and central Oregon not sampled in 1910. The objectives of the 1911 sampling was: 1) to gather data about diameter and height growth; 2) to collect silvical data that would assist in forest management of the yellow pine type; and 3) to gather data that could be used when preparing a popular monograph about western yellow pine (that monograph was eventually prepared; see "Western yellow pine in Oregon" by Munger in 1917). This report contains the following sections: objects; organization of field party; region to be covered; field operations (analysis of tree stumps and boles to obtain growth and yield information); stand measurements; silvical description of each forest; and silvical notes on special points. The 1911 sampling was scheduled to be completed in stands comprised of at least 75% yellow pine on the Umatilla, Ochoco, Deschutes, Paulina, Fremont, and Oregon (east side) National Forests. In order to estimate the proportion of a site's resources that were being used by each tree, the area or space around each stump or tree (as recorded in square feet) was to be measured or noted on a sketch map. Whenever possible, stands that had been harvested using the Forest Service's east-side management strategy called the "maturity selection system" were to be included in the sample as a way to obtain post-harvest growth data. On areas or in stands that were considered representative of yellow pine for that locality, square plots from 4 to 40 acres in size were to be delineated and all trees over 1.5" in diameter were to be measured with calipers, and total and merchantable heights were to be taken with hypsometers. In plots that had been harvested using selection cutting, it was proposed to use a "Pressler's borer" to obtain increment cores and thereby compare pre-harvest and post-harvest growth rates.
Keywords: Ponderosa pine/Oregon/Blue Mountains/Timber yields/Silvics/Historical document.

523. **Munger, Thornton T. 1930**. Ecological aspects of the transition from old forests to new. Science. 72 (1866): 327-332. **Notes**: A photocopy of an original.
Abstract: This paper was presented at a symposium on forest trees, sponsored by the Pacific Division of the American Association for the Advancement of Science, and held at Eugene, Oregon on June 19, 1930. It describes natural succession in forests of the Northwest, with particular emphasis on Douglas-fir forests, and speculates about the amount of successional stages that Lewis and Clark would have found in western Oregon. Munger describes the life history of Douglas-fir forests and comments extensively about the role that fire played in that life history. He points out that forests dominated by Douglas-fir would be considered mid successional, and that Douglas-fir would not be dominant in forests that had succeeded to the climax stage. The author then compares conditions created by logging with those that would have been created by fire or another natural disturbance, and uses the silvics of Douglas-fir to help explain why the logging practices of the day were generally ineffective at securing adequate regeneration and regrowth of Douglas-fir forest. During that discussion, he describes animal effects on seed supplies and speculates about the impact of that and other situations on the reforestation problems associated with Douglas-fir cutovers.
Keywords: Douglas-fir/Forest ecology/Historical document/Natural regeneration/Plant succession/Western Oregon.

524. **Munger, Thornton T. 1913**. Memorandum concerning the suitability of holding as national forest the lodgepole-covered pumice lands of Crook and Klamath Counties, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 13 p.
Notes: A digital version of this report is available; filename: Deschutes2. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This memorandum summarizes the results of an examination of lodgepole pine forests established on pumice lands in southern Crook and northern Klamath counties, of which there was uncertainty about their suitabil-

ity for inclusion in the Paulina National Forest. This report includes the following sections: introduction; forestal value of the lodgepole flats; and recommendations. Munger recommended that the lands in question be retained in the national forest, even though their removal would undoubtedly quiet the local clamor for their elimination. This document also includes a 2-page memorandum from Assistant District (Regional) Forester Ames that supports Munger's recommendation to retain the lands as national forest. [Note that some of the information and recommendations in this report seem to be derived from Munger's 1908 report entitled "Report on a study of the encroachment of lodgepole pine on western yellow pine on the east slopes of the Cascade Mountains in Oregon," a copy of which is contained in the history archives. The same area and the same issue described in this accession is also discussed in an article called "Replacement of yellow pine by lodgepole pine on the pumice soils of central Oregon" (Munger, 1914).]
Keywords: Historical document/Paulina NF/Lodgepole pine/Deschutes NF/Winema NF/Klamath County OR/ Crook County OR/Ponderosa pine.

525. **Munger, Thornton T. 1913**. Memorandum regarding annual timber losses on the national forests of Washington. Unpublished Typescript Memorandum. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 4 p. **Notes**: Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This memorandum (dated April 2, 1913) is in reply to a memorandum from Mr. George H. Cecil, of the Washington Office (dated March 8, 1913), requesting an estimate of the amount of timber that is being lost on the national forests of Washington each year through deterioration. Munger's response noted that very little data was available on that subject, but that by making some assumptions and using extensive reconnaissance reports, he and Mr. Hanzlik (a forest inspector) had been able to estimate an annual loss of approximately 375 million board feet due to deterioration. Munger mentioned that his estimate was less than one-half of what the author of an article in Pearson's magazine had estimated, which indicates that Cecil's memo may have been designed to get information for refuting the Pearson's article. To arrive at their estimate, Munger and Hanzlik assigned the commercial forest land in the Washington national forests to four classes: uneven-aged stands such as yellow pine forests located east of the Cascade Mountains; immature even-aged stands (age 0 to 200 years); mature even-aged stands (over 200 years old) that are thrifty; and overmature even-aged stands (over 200 years old) that are not thrifty. Munger then described the assumptions and methodology they used for arriving at their estimate. Munger also included a small table summarizing the distribution of age classes on the national forests of western Washington.
Keywords: Historical document/Decays.

526. **Munger, Thornton T. 1914**. Replacement of yellow pine by lodgepole pine on the pumice soils of central Oregon. Proceedings of the Society of American Foresters. 9 (3): 396-406.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: In central Oregon in the drainage basin of the Deschutes River was an area of one to two million acres that was unusual because the forests were comprised primarily of two species – western yellow (ponderosa) pine and lodgepole pine – that occurred in a variety of stand compositions. In some parts of the area, stands were pure yellow pine; in others, pure lodgepole pine; others saw a harmonious mixture of the two species; and in others, the two species seemed to be in an intense conflict for supremacy. What made this situation unusual was that physiographic factors varied little across the area, so any differences in stand composition could not be ascribed to variations in aspect, elevation, or anything else that might be expressed as a change in site conditions. This article contains the following sections: introduction; geographic location; physiographic types (lowland, bench, slope); soil; climate; soil water; the forest; silvical characteristics of the tree species; the effect of periodic fires; local distribution of each species; reasons for believing that lodgepole pine tends to replace yellow pine; the hypothesis of the encroachment of lodgepole; factors which have promoted the change in the forest cover; and economic aspects of the encroachment. Munger believed that a set of circumstances were required for lodgepole pine encroachment to occur: a prolonged series of forest fires that killed off many of the young yellow pines but left some mature lodgepole pine in mixed stands, rather poor yellow pine reproduction and initial growth, and good lodgepole pine reproduction and initial growth (lodgepole had an advantage over yellow pine in terms of seed production, seed dissemination, seed germination after fire, rapidity of early development, and competition for crown and root space). His conclusions were: the present area occupied by lodgepole pine was several times, if not nine times, larger than the area of ultimate lodgepole pine land (areas where pure lodgepole pine had always existed); some condition had changed in the recent past to favor lodgepole pine at the expense of yellow pine (aboriginal burning was what Munger suspected); lodgepole pine had greatly expanded its normal range; lodgepole pine had expanded on a variety of topographic situations; in the drier portions of the survey area there was a belt occupied by yellow pine that did not suffer lodgepole encroachment because it was too dry; the encroachment was not uniform or consistent, with some areas completely absent of encroachment presumably due to chance or the stochastic nature of the en-

croachment process; some of the serious encroachment was noted to be most prevalent in areas with pumice soils; if fires continued to be common in the future, encroachment could continue to be a problem; and if fire could be excluded from the area, it is doubtful that lodgepole pine could maintain itself in many of the encroached areas. Munger believed that the following forest management practices were important to favor yellow pine over lodgepole pine in areas where the two were coincident: absolute prevention of forest fires; lop and scatter brush (slash) after cutting operations, rather than burning it; cutting lodgepole to a low diameter limit and yellow pine to a high diameter limit in mixed stands; and use of yellow pine in all artificial reforestation (tree planting) operations. [Note that much of the information in this report seems to be derived from Munger's 1908 accession entitled "Report on a study of the encroachment of lodgepole pine on western yellow pine on the east slopes of the Cascade Mountains in Oregon," a copy of which is contained in the history archives. The same area and the same issue described in this accession is also discussed in an item called "Memorandum concerning the suitability of holding as national forest the lodgepole-covered pumice lands of Crook and Klamath Counties, Oregon" (Munger, 1913).]
Keywords: Historical document/Paulina NF/Lodgepole pine/Deschutes NF/Winema NF/Klamath County OR/ Crook County OR/Cascade NF/Fremont NF/Umpqua NF/Ponderosa pine.

527. **Munger, Thornton T. 1908**. Report on a study of the encroachment of lodgepole pine on western yellow pine on the east slopes of the Cascade Mountains in Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 116 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: During eleven weeks in September, October, and November of 1908, an examination was made of forest conditions on the eastern slopes of the Cascade Mountains in Oregon, ranging from a few miles north of Rosland in Crook County to a few miles south of Odessa in Klamath County. In an east-west dimension, the survey area ranged from the upper altitudinal limit of western yellow pine on the main range of the Cascade Mountains on the west, to the Fort Rock desert, the Walker Range, the western side of Big Klamath Marsh and the Williamson River on the east. The survey area was chiefly within the Deschutes, Cascade, Fremont, Umpqua, and Crater National Forests, and the Klamath Indian Reservation (now the Winema National Forest). The report includes the following sections: map of region discussed (black-and-white at 8½" x 11" and showing township lines, county lines, the Cascade Mountains, and other important landmarks); introduction; topography; rock and soil; climate; forest fires; the forest (silvical characteristics of yellow pine, silvical characteristics of lodgepole pine); local distribution of yellow pine and lodgepole pine; evidences of the encroachment of lodgepole pine (conditions about Rosland, conditions on the Paulina Mountains, conditions about Crescent, conditions on Fort Klamath Ridge, conditions about Seven Mile Ranger Station and Pelican Bay); conclusion in regard to encroachment; economic aspects of the encroachment; and recommendations (prevention of further encroachment, remedial treatment of areas on which the encroachment has already taken place). Munger believed that a set of circumstances were required for the encroachment to occur: a prolonged series of forest fires that killed off many of the young yellow pines but left some mature lodgepole pine in mixed stands, rather poor yellow pine reproduction and initial growth, and good lodgepole pine reproduction and initial growth. His conclusions were: the present area occupied by lodgepole pine was several times, if not nine times, larger than the area of ultimate lodgepole pine land (areas where pure lodgepole pine had always existed); some condition had changed in the recent past to favor lodgepole pine at the expense of yellow pine (aboriginal burning was what Munger suspected); lodgepole pine had greatly expanded its normal range; lodgepole pine had expanded on a variety of topographic situations; in the drier portions of the survey area there was a belt occupied by yellow pine that did not suffer lodgepole encroachment because it was too dry; the encroachment was not uniform or consistent, with some areas completely absent of encroachment presumably due to chance or the stochastic nature of the encroachment process; some of the serious encroachment was noted to be most prevalent in areas with pumice soils; if fires continued to be common in the future, encroachment could continue to be a problem; and if fire could be excluded from the area, it is doubtful that lodgepole pine could maintain itself in many of the encroached areas. The report apparently contained many photographs, since the negative numbers and captions were included at the end of the report, although the copy present in the National Archives did not contain the photos themselves. [Note that much of the information in this report seems to have been used for Munger's 1914 article entitled "Replacement of yellow pine by lodgepole pine on the pumice soils of central Oregon," a copy of which is contained in the history archives. The same area and the same issue described in this accession is also discussed in an item called "Memorandum concerning the suitability of holding as national forest the lodgepole-covered pumice lands of Crook and Klamath Counties, Oregon" (Munger, 1913).]
Keywords: Historical document/Paulina NF/Lodgepole pine/Deschutes NF/Winema NF/Klamath County OR/ Crook County OR/Cascade NF/Fremont NF/Umpqua NF/Ponderosa pine.

528. **Munger, Thornton T. 1910**. Silvical problems of the northwest. Unpublished Paper. Portland, OR: U.S. Department of Agriculture, Forest Service, North Pacific District. 25 p.

Notes: A photocopy of an original. A digital version of this report is available; filename: Munger1.
Abstract: This paper was delivered at the District 6 Supervisor's Meeting in Portland, Oregon on March 23, 1910. It describes early silviculture programs on the national forests of the Pacific Northwest. The author provides some opinions and interpretations about early logging operations in the region, as well as observations about pressing silvicultural problems in the area, such as encroachment in yellow pine stands by white fir and lodgepole pine. The paper also discusses the following topics: annual silvical reports, cut-over areas, and insect infestations.
Keywords: Historical document/Insect damage/Silvicultural systems/Forest management/Timber harvesting/Program administration.

529. **Munger, Thornton T. 1941**. They discuss the maturity selection system. Journal of Forestry. 39: 297-303.
Notes: A photocopy of an original.
Abstract: This entertaining article is structured as an imaginary conversation between imaginary, but very typical foresters, anywhere in the western United States. It concerns an imaginary logging operation. A forest supervisor, a regional office inspector, a college professor, a researcher, and a logging superintendent met in a ponderosa pine forest to discuss forest management – this article is a chronicle of their conversations and conclusions. The relative merits of heavy and light selection cutting were debated as a way to outline the principles of the maturity selection system. Light cutting was being considered at that time because substantial improvements in skidding and hauling equipment made it economically viable. Previously, economics and other constraints made light cutting infeasible when horse and railroad logging were the prevailing systems. The advantages of light cutting were enumerated as: 1) light cutting gets over the entire area of stagnant virgin timber more rapidly than heavy cutting; 2) light cutting leaves standing a substantial forest capital; 3) it insures the production of higher quality sawlogs; 4) it obviates the need for much slash burning, thereby keeping costs down and lowering the risk of soil damage; 5) it is just as favorable for regeneration as heavy cutting; 6) it better safeguards the cut-over area from wind damage; 7) it establishes the transportation system quickly, thus improving the options for frequent salvage entries into an area; 8) it is superior from the perspective of aesthetics, recreation, etc.; and 9) it can be practiced without materially increasing the logging cost per thousand board feet. The balance of the article provides a thorough discusssion of the operational details of the maturity selection system as it was practiced in ponderosa pine forests.
Keywords: Maturity selection system/Historical document/Ponderosa pine/Sanitation-salvage cutting/Selective cutting/Selection cutting.

530. **Munger, Thornton T. 1917**. Western yellow pine in Oregon. Bulletin No. 418. Washington, DC: U.S. Department of Agriculture. 48 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is the definitive early work on ponderosa pine in Oregon, including a map showing the distribution of Oregon's pine forests around 1915. Included is the following information about ponderosa pine forests in Oregon: distribution, silvical requirements, reproduction, fire effects, insect and pathogen influences, stand characteristics, timber volumes, tree growth, wood characteristics, utilization, logging and milling, planting, stock grazing, and forest management practices. Appendices provide 2 regional volume tables, including one for the Blue Mountains, as well as marking guides and slash disposal specifications. Several excellent black-and-white photographs are also included. Note that several of the office reports that formed the basis for this bulletin are also included in the history archives, such as "A study of the growth of yellow pine in Oregon" by G. A. Bright (1912). This excellent work includes interesting insights about early forest conditions in eastern Oregon and the Blue Mountains, as illustrated here: "In most of the pure yellow-pine forests of the State the trees are spaced rather widely, the ground is fairly free from underbrush and debris, and travel through them on foot or horseback is interrupted only by occasional patches of saplings and fallen trees. The forests are usually not solid and continuous for great distances, except along the eastern base of the Cascades, but are broken by treeless "scab-rock ridges," or natural meadows;" "In the Blue Mountains the herbage is rather more luxuriant and varied than on the eastern slopes of the Cascades and their outstanding ranges. In the early summer the open yellow-pine forests are as green with fresh herbage as a lawn, except here and there where the green is tinged with patches of yellow or purple flowers. Some of this luxuriant herbage is pine grass *(Calamagrostis* sp.), a plant which is not eaten by stock except very early in the season; but much of the ground cover makes excellent range for cattle and sheep;" "In the Blue Mountains western larch *(Larix occidentalis)* is its [western yellow pine] usual companion and grows with it in an intimate and harmonious mixture. In the moister situations white fir *(Abies concolor)* is a common associate, as is also Douglas fir *(Pseudotsuga taxifolia)* in most parts of the State. In the Blue Mountains it is common for the south slopes to be covered with a fine stand of yellow pine, while the north slopes are covered almost entirely with larch, white fir, and Douglas fir;" "In the Blue Mountains the reproduction of yellow pine is very abundant, both in the virgin forest and after cuttings. Perhaps it is more prolific here than anywhere else. In this region where an area has not been burned over by a surface fire for a number of years, there is quite commonly a veritable thicket of little trees from a few inches to several feet high. Actual counts have shown that there are sometimes 14,000 seedlings on a single acre, the ages ranging

from 13 to 21 years;" "In pure, fully stocked stands in the Blue Mountains region there are commonly from 20 to 30 yellow pines per acre over 12 inches in diameter, of which but few are over 30 inches. Over large areas the average number per acre is ordinarily less than 20. In mixed stands the number of yellow pines of merchantable size is naturally less, though the total number of trees of all species is as a rule larger, the moist soil on which the mixed forest grows being able to carry a denser stand;" "Yellow pine grows commonly in many-aged stands; i.e., trees of all ages from seedlings to 500-year-old veterans, with every age gradation between, are found in intimate mixture. Usually two or three or more trees of a certain age are found in a small group by themselves, the reason being that a group of many young trees usually starts in the gap which a large one makes when it dies;" "Light, slowly spreading fires that form a blaze not more than 2 or 3 feet high and that burn chiefly the dry grass, needles, and underbrush start freely in yellow-pine forests, because for several months each summer the surface litter is dry enough to burn readily. Practically every acre of virgin yellow-pine timberland in central and eastern Oregon has been run over by fire during the lifetime of the present forest, and much of it has been repeatedly scourged. It is sometimes supposed that these light surface fires, which have in the past run through the yellow-pine forests periodically, do no damage to the timber, but that they "protect" it from possible severe conflagrations by burning up the surface debris before it accumulates. This is a mistake. These repeated fires, no matter how light, do in the aggregate an enormous amount of damage to yellow-pine forests, not alone to the young trees, but to the present mature merchantable timber;" "A careful cruise of every tree on 154½ sample acres in typical yellow-pine stands in several localities in the Blue Mountains showed that 42 out of every 100 trees were fire-scarred;" "Ordinarily, a fire in yellow-pine woods is comparatively easy to check. Its advance under usual conditions may be stopped by patrolmen on a fire line a foot or so wide, either with or without backfiring. The open character of the woods makes the construction of fire lines relatively easy, and in many places horses may be used to plow them."
Keywords: Ponderosa pine/Oregon/Blue Mountains/Timber yields/Fire effects/Silvics/Historical document.

531. **Munger, Thornton T.; Brandstrom, Axel J. F.; Kolbe, Ernest L. 1936**. Basic considerations in the management of ponderosa pine forests by the maturity selection system. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 4 p.
Notes: An original copy.
Abstract: This short report or memorandum summarizes the conclusions and recommendations of studies made by the Pacific Northwest Forest Experiment Station that relate to the maturity selection system. The maturity selection system was a silvicultural or management system that involved rather light and frequent cutting predicated on the financial and biological maturity of the trees. To clarify the concepts of that new system of management for ponderosa pine forests, this paper provides 18 basic considerations for how the maturity selection was intended to be used. [See Munger 1941 for another article concerning the maturity selection system and its use in ponderosa pine forests.]
Keywords: Maturity selection system/Historical document/Ponderosa pine/Sanitation-salvage cutting/Selective cutting/Selection cutting.

532. **Munger, Thornton T.; Briegleb, Philip A. 1942**. Recent developments in pine silviculture. Northwest Science. 16: 40-45. **Notes**: A photocopy of an original.
Abstract: This article describes changes in logging methods that were occurring in the late 1930s and early 1940s as tractors were replacing horses and trucks were replacing railroad equipment. One of the economic implications of those changes was that logging costs were suddenly much lower than they used to be. Since silvicultural treatments no longer had to generate a lot of high-value timber volume in order to be economically viable, it was then possible to treat previously unmerchantable stands, to consider more partial cutting and other low-volume prescriptions, and to adjust cutting cycles and other treatment parameters that had previously been predicated on heavy volume removals. In the horse and railroad days, it was common for a harvest to remove 75 to 85 percent of a stand's volume, an entry so heavy that an unusually long 60-year cutting cycle was planned because it was thought the stand would take that long to recover. Munger then describes a proposed cutting system called the "maturity selection system." It was designed to quickly cover a large area and thereby remove relatively light volumes of mostly overmature volume that was often being killed by western pine beetle. The author illustrates this concept with examples from the Malheur, Deschutes, and Whitman National Forests in Oregon, and with several examples from private or Indian lands in Oregon and Washington.
Keywords: Deschutes NF/Eastern Oregon/Eastern Washington/Forest economics/Forest regulation/Historical document/Klamath Indian Reservation/Malheur NF/Ponderosa pine/Sanitation-salvage cutting/Silviculture/Whitman NF.

533. **Munger, Thornton T.; Matthews, Donald N. 1941**. Slash disposal and forest management after clear cutting in the Douglas-fir region. Circular No. 586. Washington, DC: U.S. Department of Agriculture. 55 p. **Size**: 6" x 9".

Notes: An original copy. Issued in January, 1941.
Abstract: The treatment of slash after cutting in the Douglas-fir region, especially whether or not to burn, when to burn, and how to burn, has been discussed for as long as cutting has been occurring in that forest type. Since no consensus had been reached, this circular was prepared to synthesize pertinent information about slash treatment, and to report the results of a slash treatment study initiated in 1926. It includes the following sections: introduction; fire danger on slash areas; slash disposal laws and practices; relation of slash disposal to fire hazard; relation of slash disposal to reforestation; other effects of slash disposal; principles of slash burning; essential steps in protecting logged off lands from fire; incidental commercial uses of cut-over land; summary; and literature cited.
Keywords: Slash disposal/Fire prevention/Historical document/Western Oregon/Western Washington/Clearcutting/Coastal Douglas-fir.

534. **Munger, Thornton T.; Westveld, R. H. 1931**. Slash disposal in the western yellow pine forests of Oregon and Washington. Technical Bulletin No. 259. Washington, DC: U.S. Department of Agriculture. 58 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the alternatives for slash disposal after logging in ponderosa pine forests of the Pacific Northwest. Considerations affecting slash disposal are discussed, including quantity and distribution of slash, its decay rate, slash effects on regeneration, fire hazard concerns, and the effects of slash on soil, insects and pathogens, and range management. The economics of slash treatment are discussed. Common treatment methods are described, including broadcast burning, spot burning, piling and burning, swamper burning, no burning, strip burning, and partial burning with fire protection. An example of a slash disposal plan is provided. Appendix material describes different techniques of slash piling.
Keywords: Slash treatment/Pacific Northwest/Ponderosa pine/Eastern Oregon/Eastern Washington/Broadcast burning/Pile burning/Historical document/Logging residue.

535. **Munns, E. N. 1928**. The forester biologist. Unpublished Typescript Memorandum. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 3 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This memorandum, dated July 30, 1928, was authored by the Chief of the Office of Forest Experiment Stations and addressed to Professor Alvin G. Whitney, University of Michigan, Ann Arbor, Michigan. It is in response to one that Whitney had sent on July 26th. Although the July 26th memo is not included with this document, it appears that Whitney was concerned about improving the forestry skills and knowledge of wildlife students. In Munns' response, he laments that all of the newly-hired entomologists and pathologists only knew about entomology and pathology – "the problems of the forest were not the problems these men saw, but they saw the problems of pathology and of insects." He goes on to say that those two fields were growing closer together by procuring foresters first and the specialists second. "In this way, the problems became those of forest management." He then describes a series of relatively impromptu meetings that were held over the previous winter, when researchers from all disciplines came together to discuss a particular topic. There were no set speeches, only an announced subject, and the meetings turned into spirited debates that often got out of hand, with frequent arguments and scraps. But the net result was to show how the work of one man was related to the work of others, so that entomology and biology found common ground, meteorology and grazing found things in common, and so forth. Munns also noted that the Biological Survey tended to look on foresters with suspicion, perhaps out of jealousy because of their dominant position in the Forest Service. Munns also felt that the perspective of the Survey was narrow and their ideas limited, primarily because they had adopted a "zoological approach." Munns also responds to Whitney's concern about why there were no questions about wildlife management on the junior forester examination. Although Munns agreed with that concept, he stated that there were too many demands on the examination and that it would not be possible to drop forestry questions (silviculture, management, protection, etc.) in favor of adding non-forestry topics. Munns also states that wildlife management in the United States is the responsibility of both State fish and game outfits, and forester biologists, but that he believed that we would eventually have a system like Europe's in which forestry and wildlife were managed by a single entity.
Keywords: Forest staffing/Historical document/Wildlife management.

536. **Munns, E. N.; Hoerner, Theresa G.; Clements, V. A. 1947**. Converting factors and tables of equivalents used in forestry. Miscellaneous Publication No. 225. Washington, DC: U.S. Department of Agriculture, Forest Service. 48 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This handbook provides conversion factors and related tables commonly used in the forestry profession. They are presented in tabular form where it appears most advantageous to do so; in other cases, a series of charts are provided that permit the easy determination of values.
Keywords: Timber measurements/Conversion factors/Historical document.

537. **Nash, Wallis**. **1906**. Feuds and forays of the Oregon range. The Pacific Monthly. 15 (3): 248-255.
Notes: A photocopy of an original.
Abstract: This article discusses the story of the sheep and the forest reserves and the Great Stock Parliament. A meeting in Walla Walla, Washington on December 16, 1905 is described, at which 300 men gathered to discuss livestock grazing matters on three western forest reserves. Since the issues and debates concerning apportionment of the public grazing areas were acrimonious, two committees were appointed: one with 11 cattle men, and one with 11 sheep men. After 3 days of committee work, divisions of range were agreed to, numbers of stock to be fed on the reserves settled, rental rates fixed, and regulations agreed to.
Keywords: Range history/Eastern Oregon/Forest reserves/Grazing/Historical document/Range management/Sheep grazing/Cattle grazing.

538. **Newell, Frederick H. 1897**. The national forest reserves. National Geographic. 8: 177-187.
Notes: A photocopy of the original article published in June, 1897.
Abstract: This article discusses land settlement patterns in the United States, with a particular emphasis on the western half of the country. Newell states that there are over 75,000,000 acres of forest in the arid and semiarid portions of the western states, with over 118,000,000 additional acres with "scattering trees suitable for firewood, fencing, or other farm purposes." The author states that the highest value of western forests is as a source of water, upon which every other endeavor or industry relies. Tabular and graphical summaries are provided of the land types for 17 western states, summarizing the acres of total land, forests, woodlands, and treeless and improved areas. Other summaries provide estimates of the area of grazing, wood, forest, and desert lands, and the acreage that could be supplied with water. Newell goes on to support government efforts to preserve western forests, rather than allowing them to pass into private ownership, because experience has shown "that individual and present profits are as a rule placed far above public and remote interests." He also stated that "an agency of longer life than that of ordinary men is needed to sustain the work of forest production – such an agency, in short, as is the state or nation." Newell describes extensive efforts to accomplish reservation of western forests by Congress, the American Forestry Association, the National Academy of Sciences, and other groups. He ends by describing provisions of an act passed in June, 1897 that authorized reservation of forests in accordance with previous provisions of the McRae bill, which had failed passage several times.
Keywords: Historical document/Forest history/Forest reserves/National forests.

539. **Newhall, Charles S. 1902**. Fire and the forest reserves. Forum. 33 (March): 109-120.
Notes: A photocopy of an original.
Abstract: This early article describes the hardest problem of forestry: the fire problem. The following topics are discussed with respect to forest fires and the forest reserves: the harm that comes from fires; their sources; what can be done defensively for the protection of the forests; what can be done aggressively for protection of the forests; and the resources available for fighting fires. It is interesting that Newhall also mentions that in several areas of the country, the phrase "he put out a fire" refers not to extinguishing a fire, but to setting (putting) one out!
Keywords: Fire control/Fire effects/Fire fighting/Fire prevention/Forest fires/Historical document.

540. **Newhall, Charles S. 1901**. Sheep and the forest reserves. Forum. 30 (Feb.): 710-716.
Notes: A photocopy of an original.
Abstract: This article describes the effects of sheep grazing on the forest reserves at the turn of the century. The article begins with a humorous anecdote involving John Muir and a camping trip to the high country of the Sierra Nevada mountains. Newhall believes that sheep grazing needed to be curtailed in the reserves because their primary purpose was to conserve the water supply of the mountains, and that is not possible if the sheep are allowed to consume all of the vegetation. This article provides interesting observations of sheep grazing effects in the Sierras, and describes the history of sheep grazing in that area for the latter half of the 1800s.
Keywords: Grazing/Grazing damage/Historical document/Sheep grazing/Sierra Nevada Mountains.

541. **Norcross, T. W. 1936**. Forest Service map standards. Unnumbered Published Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 31 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This accession was used by Forest Service cartographers as they assembled maps for a variety of purposes. It covers all aspects of map compilation and production, whether the final product was designed for public distribution or internal use. It includes the following sections: works and structures; boundaries and monuments; drainage; relief; lettering (styles, sizes); administrative map title and legend; special map legends (fire, range management, recreation, forest management, sample plot mapping, forest road system, proclamation diagrams and executive orders, federal land ownership, air navigation, arrow and declination diagram, survey index record, tele-

phone); marginal data, credit note, bar scale, gage for border and gage for main line of title; map sheet sizes; township plat layout (4 in. = 1 mile); atlas folio sheet layout; abbreviations; color formulas; color legends; scales and equivalents; and planimeter chart. This item should be helpful for interpreting maps that date from the early to mid 1930s.
Keywords: Historical document/Forest mapping/Cartographic data/Maps.

542. **O'Brien, Howard K. 1909**. Umatilla National Forest inspection report. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. Variable p.
Notes: A digital version of this report is available; filename: Umatilla2. Photocopy from an original located at the Pacific NW Region of the National Archives in Seattle, WA.
Abstract: After establishment of the forest reserves and national forests early in the twentieth century, inspections were supposed to be made at regular intervals. Initially, inspections were conducted by Forest Inspectors stationed at the District (Regional) Offices. Later, that responsibility was transferred to the Forest Supervisors, who were responsible for inspecting their own Forest (see G. H. Cecil, 1910, "Memorandum regarding Supervisor's inspections" for more information). This national forest inspection report includes the following sections: grazing (22 p.); boundaries (6 p.); protection and improvements (29 p.); and organization (18 p.).
Keywords: Historical document/Program administration/Umatilla NF/Blue Mountains.

543. **Olmsted, F. L.; Harrison, J. B. 1889**. Observations on the treatment of public plantations, more especially relating to the use of the axe. Boston, MA: T. R. Marvin & Sons, Printers. 24 p. **Size**: 6" x 9".
Notes: A photocopy of an original.
Abstract: This interesting brochure was designed to make a case for thinning in public plantations, which were defined as the tree plantings made in public parks and other urban reserves. The main author, Frederick Law Olmsted, was considered to be the preeminent landscape architect of his day. He bemoaned how difficult it was to thin public plantations due to public sentiment against tree cutting. For example, he describes how ladies and gentlemen using the public parks have stood before trees being cut in protest of their removal, even attempting to wrest the axe from the hands of the woodsman. In other instances, the parks managers took to sending out their thinning crews during bad weather, realizing that they were less likely to be seen by the public then. The bulk of this brochure consists of quotes that Olmsted and Harrison compiled, mostly from literature published in Europe, that described the beneficial effects of thinning (i.e., "the old agage, 'plant thick and thin quick' holds as good now as centuries ago;" "to give such general rules for thinning as might be understood by those who never attentively and scientifically considered the subject would be like attempting to direct a man who had never used a pencil to imitate the groups of a Claude or a Poussin"). They also recount many personal experiences such as projects where a nurse crop was planted, with the desired trees planted under them, but the projects ultimately failed because the nurse crop was not removed promptly after establishment of the desired trees, or the desired trees were planted too closely and never thinned.
Keywords: Forest management/Historical document/Thinning/Tree planting/Frederick Olmsted/Urban forestry.

544. **Oregon Department of Forestry** . **1972**. The Douglas-fir tussock moth in northeastern Oregon. Unnumbered Folded Brochure. Salem, OR: Oregon State Department of Forestry. 2 p. **Notes**: An original copy.
Abstract: This accession consists of a front-and-back brochure printed on yellow, 8½" x 11" paper and folded three times, resulting in a folded product that was 3.625" high by 8½" long. It was designed as a public information sheet describing the Douglas-fir tussock moth (DFTM) outbreak in the Blue Mountains of northeastern Oregon and southeastern Washington. It includes the following sections: introduction; damage; life cycle; control; additional problems; and decisions. It also includes seven photographs, four of which have the following captions: larva; moth; eggs; and damage.
Keywords: Blue Mountains/DDT/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/ Umatilla NF/Chemical insecticides.

545. **Oregon State Board of Forestry; U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine**. **1950**. Report of forest insect detection surveys in Oregon and Washington, season of 1950. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 33 p. **Notes**: An original copy, printed double-sided.
Abstract: At the time this report was written, a widespread outbreak of western spruce budworm continued as a major threat to the forests of Oregon and Washington. Control efforts during the preceeding two years had undoubtedly prevented extensive forest mortality, but vast areas of infestation remained, and the continuation of a vigorous control program was still urgently needed. Surveys made during the years 1947 to 1949 showed the budworm outbreak to be developing rapidly, both in size and intensity. The 1949 survey was the first all-inclusive for-

est insect survey of Oregon and Washington (prior to 1949, the survey was directed just at spruce budworm, not other forest insects). The first effort to control the budworm outbreak occurred during May and June of 1949 when the U.S. Forest Service and the Oregon State Board of Forestry treated 106,000 acres on the Mt. Hood National Forest, and 161,000 acres in the vicinity of Eugene, Oregon. While satisfactory results were obtained in those areas, the results of the 1949 survey indicated that a greatly expanded treatment program was needed if the objective was to control the entire outbreak. Accordingly, during June and July of 1950, 933,700 acres were treated, most of which (775,000 acres) were in the Blue Mountains of northeastern Oregon and southeastern Washington. This report tabulates and summarizes the results of the 1950 aerial survey and uses those results as the basis to plan for further control efforts. It includes the following sections: introduction; part 1: spruce budworm situation (general statement, Blue Mountains, eastern Oregon Cascades, western Oregon, eastern Washington Cascades, western Washington, and recommendations); part 2: other insect problems (mountain pine beetle, western pine beetle, fir engraver beetles, and hemlock looper); and appendix (acknowledgements, tables, survey forms, and an infestation map). As of the 1950 aerial survey, the Blue Mountains had the most extensive area of infestation, with 1,810,080 acres still present even after the 1950 control project had been completed. The most critical portion of the Blue Mountains infestation was located on the Umatilla National Forest, which had 625,000 acres sprayed with DDT during the 1950 control project. Spraying reduced the acreage in the "heavy" and "dead" classifications (from the aerial survey) from 610,720 acres to 103,520 acres. Even so, the acreage of infestation remained very high – 857,000 acres were still shown with some level of budworm damage. The areas of heavy infestation remaining after the 1950 control project in the Umatilla NF were centered in the following locations: Upper Rhea, Willow, and Johnson Creek drainages; Jarbeau and Fry Meadows; Touchet and Tucannon River drainages; Kinzua watershed; Meacham Summit area; Camas and Owing Creek drainages; and Anatone-Big Butte areas. The author recommended that the entire remaining infestation in the Umatilla NF be treated as soon as possible, preferably in 1951 so that areas adjacent to the 1950 treatment areas would not serve as reservoirs of budworm to reinfest the treated sites.
Keywords: Western spruce budworm/Insect damage/Insect control/Historical document/Blue Mountains/Mt. Hood NF/Umatilla NF/Insect surveys.

546. **Oswald, Felix**. **1879**. The preservation of forests. North American Review. 128: 35-46.
Notes: A photocopy of the original article published in January 1879. This copy is missing page 46.
Abstract: This article discusses the importance of forests to civilization. It describes many early civilizations (Afghanistan, Mesopotamia, Persia, Egypt, Syria, Asia Minor, Greece, Macedonia, the southern islands of the Mediterranean, and the whole of northern Africa) that suffered after destroying their native vegetation and associated soils, particularly with regard to forest cover. The author goes on to describe the deforestation occurring in North America and speculates that, if it continues, similar problems could occur there as were discussed for Asia, Europe, and Africa. He recommends the following measures: reserve a tract of forest in each township as a "township grove" for picnicking, wildlife habitat, and recreation; leave remnant forests on summits or ridges in developed areas; practice tree culture to favor tree establishment in arid areas of the country; plant shade trees and hedges next to fields and in waste areas; and plant fruit trees on productive ground not being used for anything else.
Keywords: Deforestation/Forest policy/Historical document/Forest history.

547. **Overmeyer, Philip Henry**. **1941**. George B. McClellan and the Pacific Northwest. Pacific Northwest Quarterly. 30 (January): 3-60. **Notes**: A photocopy of an original.
Abstract: This long article describes the surveys conducted by the War Department to help determine the most practical route for a transcontinental railroad. George B. McClellan led one of two exploration parties that explored the area between the 47th and 49th parallels. Isaac Ingalls Stevens, who was the expedition's overall leader and later became governor of the Washington Territory, led a contingent westward from the Great Lakes, while McClellan led another force eastward from the Puget Sound region. The balance of this article is a thorough and detailed account of McClellan's portion of the expedition, including copious use of his expedition diaries and official correspondence.
Keywords: Cascade Mountains/Eastern Washington/Forest history/Historical document/Pacific Northwest/Pacific Railroad Surveys/George McClellan/Isaac Stevens/Explorer journals.

548. **Pack, Arthur Newton**. **1933**. Forestry: an economic challenge. New York, NY: The Macmillan Company. 161 p.
Size: 6" x 8". **Notes**: An original copy.
Abstract: This book contains the following chapters: re-thinking forestry; from crusade to economic problem; forest use; private enterprise; public forest administration; foresters and forest education; and regional planning and economic policy.
Keywords: Historical document/Forest economics/Forest policy.

549. **Pack, Charles Lathrop; Gill, Tom**. **1929**. Forests and mankind. New York, NY: The Macmillan Company. 250 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: This classic work includes the following chapters: the tree – masterpiece of the plant world; how trees grow; the forest; the forests of long ago; forests of the world; forests of the United States; what forestry is; how the forester works; forestry in the United States; our national forests; how the forests help mankind; wood – greatest gift of the forest; where our paper comes from; other gifts of the forest; forests and wild life; forest enemies; fire – the great destroyer; the war against wood waste; forestry and the farmer; industrial forestry; and the task ahead.
Keywords: Historical document/Forest management/Forest policy/Forest history.

550. **Palmer, Charlotte**. **1971**. Conservation and the camera. Prologue. 3 (Winter): 183-196.
Notes: A photocopy of an original.
Abstract: This article describes Forest Service photographs deposited in the National Archives. At the time it was written, nearly 10,000 photographs covering the period from 1895 to 1910 had been deposited in the Audiovisual Archives Division for use by researchers and other Archives patrons. The article provides an interesting history of photography in the Forest Service, going back to Gifford Pinchot’s early photographic efforts and his emphasis on photography in the Forest Service because of its value for education and monitoring. The first Forest Service Manual on photography was prepared by George Sudworth in 1906. The bulk of this article is an example of dozens of Forest Service photographs now available in the Archives.
Keywords: Photography/U.S. Forest Service history/Forest history/National Archives/Gifford Pinchot.

551. **Palmer, T. S. 1922**. Game as a national resource. Bulletin No. 1049. Washington, DC: U.S. Department of Agriculture. 48 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin discusses the importance of game animals in the United States. It describes principal game species, and the value of game animals to farmers and as a source of revenue for the states. Several practices or methods to increase game populations are described, as are the costs of game management. A proposed method for conducting game surveys is presented.
Keywords: Wildlife management/Game refuges/Big game/Historical document.

552. **Pardee, J. T. [Date unknown]**. Geological Survey camp in pine forest near Whitney. Photo Number 268. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Whitney, Oregon. **Size**: 8” x 10”.
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. The print quality is good; both the foreground and background portions are in moderate to sharp focus. The picture is a black and white photograph showing a Geological Survey camp in a pine forest near Whitney, Oregon, which is a small townsite east of Austin and west of Sumpter. The vegetation is comprised of medium to large diameter ponderosa pine. Ground cover appears to be dominated mostly by grass and forbs. In addition, it appears that some Douglas-fir is intermixed with the ponderosa pine.
Keywords: Historical photograph/Whitney OR/Blue Mountains/Ponderosa pine/Rocky Mountain Douglas-fir/Wallowa-Whitman NF.

553. **Pardee, J. T. [Date Unknown]**. Glaciated valley at head of Crawfish Creek. Photo Number 21. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 7 S., R. 36 E. **Size**: 8” x 10”.
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned the U. S. Geological Survey. The print quality is good to moderate; both the foreground and background portions are in moderate to sharp focus. The picture is a black and white photograph of a glaciated valley. The vegetation in the foreground and middleground appears to be subalpine fir and Engelmann spruce. The middleground contains two meadows and rocky slopes. There appears to be a large valley in the far distance (background). A quick perusal of the Wallowa-Whitman’s recreation visitor’s map showed a Crawfish Creek draining into the North Fork of the John Day River, with its headwaters being approximately one mile from Anthony Lakes. Crawfish Lake, in the North Fork John Day Wilderness, is also located in the headwaters area.
Keywords: Historical photograph/Sumpter OR/Blue Mountains/Subalpine fir/Engelmann spruce/Wallowa-Whitman NF/Malheur NF/Mountain meadows/Crawfish Creek/Crawfish Lake/North Fork John Day Wilderness/Anthony Lakes.

554. **Pardee, J. T. [Date unknown]**. Government trail through lodgepole pine forest. Photo Number 290. [Publisher unknown]. **Locality**: [Locality unknown]. **Size**: 8” x 10”.
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.

Abstract: Photographer was assigned to the U. S. Geological Survey. The picture is a black and white photograph showing a trail going through an extremely dense lodgepole pine stand. The stand is in the stem exclusion stage, with no tree regeneration in evidence and absolutely no ground cover other than woody debris and litter/duff. Print quality is moderate to good, with most portions of the foreground and background views in sharp focus.
Keywords: Historical photograph/Blue Mountains/Lodgepole pine/Stem exclusion.

555. **Pardee, J. T. [Date unknown]**. Hydraulic mining, North Fork placer mine. Photo Number 284. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: North Fork of Trail Creek, near North Fork John Day River? **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. This picture is a black and white photograph showing a hydraulic mining operation, possibly on the North Fork of Trail Creek near its junction with the North Fork of the John Day River. The print quality is good; both the foreground and background portions are in moderate to sharp focus. A nozzle was operating when this image was acquired, and a sluiceway is shown in the middleground, with water coursing through it and out one end. Most of the foreground and middleground depicts large cobbles and rocks as one would expect from the tailings produced by a hydraulic operation. Much of the background shows steep-sided slopes of bare soil that were apparently exposed by previous dredging operations. In the left middleground is a pile of pipe that was related to the dredging operation. The far background depicts a dense conifer stand that consists primarily of lodgepole pine, possibly with intermixed western larch and other species.
Keywords: Historical photograph/Blue Mountains/Lodgepole pine/Western larch/Wallowa-Whitman NF/Trail Creek/Placer mining/Hydraulic mining/North Fork John Day River.

556. **Pardee, J. T. [Date unknown]**. A lodgepole pine forest. Photo Number 264. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Sumpter quadrangle. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. Print quality is poor, with most of the image at least slightly out of focus. It is likely that the focus problem is associated with the negative from which the print was made. The picture is a black and white photograph showing a lodgepole pine stand with a native-surface road located in the center of the foreground area. The road has low to moderate ruts associated apparently with wagon use. The lodgepole stand is apparently in the understory reinitiation stage, with some portions being very dense and others beginning to degenerate, which was allowing shade-tolerant species such as grand fir to get established in the understory. Downed logs and woody debris can also be distinguished on the forest floor. Old, heavily-diseased western larches can also be discerned in the background; they have dead tops, sparse crowns, and are probably infected with dwarf mistletoe.
Keywords: Historical photograph/Blue Mountains/Grand fir/Western larch/Wallowa-Whitman NF/Lodgepole pine/Plant succession.

557. **Pardee, J. T. [Date unknown]**. Logged-off land near Whitney. Photo Number 269. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Whitney OR. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. Print quality is moderate, with most of the image at least slightly out of focus. It is likely that the focus problem is associated with the negative from which the print was made. The picture is a black and white photograph showing a logged area on private land (outside of the Whitman National Forest) near Whitney, Oregon. The vegetation in the photograph is composed of grass, small shrubs, and ponderosa pine. The area within the photo had been harvested within the relatively recent past; a large component of down logs remained after the harvest. The area depicted is relatively broad and flat. [Note: logging on the Whitman National Forest, most of which was selective or partial cuttings in the ponderosa pine type, began about 1910 and by 1915, about 6,000 acres of yellow (ponderosa) pine forest had been cut-over using selection cutting.].
Keywords: Historical photograph/Blue Mountains/Ponderosa pine/Wallowa-Whitman NF/Cutover areas/Selection cutting/Timber harvesting.

558. **Pardee, J. T. [Date unknown]**. Logged-off lands near Austin. Photo Number 261. U.S. Department of Agriculture, Forest Service, Malheur National Forest. **Locality**: Austin, Oregon. **Size:** 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. Print quality is moderate, with most of the image at least slightly out of focus. It is likely that the focus problem is associated with the negative from which the print was made. This picture is a black and white photograph of a logged area on national forest lands near Austin,

Oregon. It appears that much of the ponderosa pine volume was harvested from the area depicted in this photograph, although some of the larger trees were left as a seed source. Vegetation in the foreground includes young ponderosa pine seedlings in addition to grasses, forbs, and low shrubs. The middleground contains scattered medium size ponderosa pine and Douglas-fir. In the distant background, an apparently untreated forest area contains an uneven-aged mixed-conifer stand with a predominance of grand fir, ponderosa pine, and Douglas-fir. [Note : logging on the Whitman National Forest (at the time this photograph was acquired, the portion of the Malheur NF adjoining Austin was included within the Whitman NF), most of which was selective or partial cuttings in the ponderosa pine type, began about 1910 and by 1915, about 6,000 acres of yellow (ponderosa) pine forest had been cutover using selection cutting.].
Keywords: Historical photograph/Blue Mountains/Ponderosa pine/Malheur NF/Cutover areas/Selection cutting/Timber harvesting.

559. **Pardee, J. T. [Date unknown]**. North Fork placer mine in glacial moraine. Photo Number 283. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: North Fork of Trail Creek, near North Fork John Day River? **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. This picture is a black and white photograph showing the North Fork placer mine, which was operating in a glacial moraine. The photograph graphically displays the effects of a hydraulic mining operation, possibly one located on the North Fork of Trail Creek near its junction with the North Fork of the John Day River. The print quality is moderate to good; most of the foreground and background portions are in moderate to sharp focus. Very little undisturbed area is visible in the foreground or middleground portions of this scene. Many areas consist of either cobble-type rubble or sandy, exposed areas that constitute the stream channel, such as it was at the time. A scattering of young, "bushy" lodgepole pines are established in a zone across the middleground portion. Evidence of hydraulic mining activity, including exposed, apparently eroding hillsides, is also obvious in background portions of this photograph.
Keywords: Historical photograph/Blue Mountains/Lodgepole pine/Wallowa-Whitman NF/Trail Creek/Placer mining/Hydraulic mining/North Fork John Day River.

560. **Pardee, J. T. [Date unknown]**. South slope of Greenhorn Mountain. Photo Number 267. U.S. Department of Agriculture, Forest Service, Umatilla and Wallowa-Whitman National Forests. **Locality**: Greenhorn Mountain. **Size**: 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. The picture is a black and white photograph showing the south slope of Greenhorn Mountain. The print quality is good; both the foreground and background portions are in moderate to sharp focus. Most of the foreground shows forbs and grasses on a high-elevation site that is either an alpine environment, or a subalpine-zone meadow. Some of the floristic composition in the foreground area may include green fescue. The middleground depicts a typical subalpine environment, with variable-density stands of Engelmann spruce and subalpine fir intermixed with mountain meadows. Although crown silhouettes are not always clear enough to discriminate individual species, it is possible that whitebark pine also occurs somewhere in this scene. The background shows several mountain summits and additional alpine sites, including talus slopes. A summit in the upper left background may be Greenhorn Mountain itself.
Keywords: Greenhorn Mountain/Historical photograph/Blue Mountains/Whitebark pine/Engelmann spruce/Wallowa-Whitman NF/Umatilla NF/Green fescue/Subalpine fir.

561. **Pardee, J. T. [Date unknown]**. Spruce forest, 1 mile east of Greenhorn. Photo Number 262. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 10 S., R. 35 E., sec. 10. **Size**: 8" x 10". **Notes**: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. This picture is a black and white photograph showing a spruce forest approximately one mile east of the mining district of Greenhorn. The print quality is good; both the foreground and background portions are in sharp focus. The foreground shows a native-surface road with two ruts and several high stumps from the road right-of-way clearing; one of the stumps is charred, indicating that slash from the clearing operation was probably burned on-site. Several subalpine fir seedlings can be discerned in the foreground and middleground. Shrubs, possibly *Ribes*, are also apparent. The middleground and background shows a dense, multi-layered forest comprised of Douglas-fir, Engelmann spruce, grand fir, western larch and subalpine fir. There are several large-diameter snags present, most of which are broken off approximately 15 feet above the ground. In the mature forest portion of the photograph, a large amount of downed wood is present on the ground.
Keywords: Greenhorn Mountain/Historical photograph/Blue Mountains/Subalpine fir/Engelmann spruce/Wallowa-

Whitman NF/Western larch/Rocky Mountain Douglas-fir/Grand fir/Ribes/Snags.

562. **Pardee, J. T. [Date unknown]**. Yellow pine forest. Photo Number 256. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Sumpter quadrangle. **Size:** 8" x 10".
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned the U. S. Geological Survey. This picture is a black and white photograph showing a yellow (ponderosa) pine forest. The print quality is good; both the foreground and background portions are in moderate to sharp focus. Although the photographer states that a yellow pine forest is depicted, the area is actually a mix of various conifers. Overstory vegetation is comprised of western larch, ponderosa pine, and grand fir. The understory is primarily shrubs and grass. At the time this photograph was acquired, there was a mid-height shrub in flower, possibly snowbrush ceanothus. Several large pieces of downed wood are on the ground in the foreground; one of them seems to be from Douglas-fir or lodgepole pine. A mature western larch in the middleground appears to have a severe infection of dwarf mistletoe based on a large number of brooms present in the crown.
Keywords: Historical photograph/Blue Mountains/Ponderosa pine/Western larch/Wallowa-Whitman NF/Rocky Mountain Douglas-fir/Snowbrush ceanothus/Grand fir.

563. **Parsons, Glenn B. 1948**. Timber disposal plan, Heppner Working Circle. Unpublished Typescript Report. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 34 p.
Notes: A digital version of this report is available; filename: Umatilla8. An original copy.
Abstract: This report includes the following sections: introduction; management objectives; analysis of national forest resources; calculation of allowable annual cut; and sale program. Volume summary tables are provided for the following blocks: Ditch Creek, Fossil, Lonerock, Potamus, Rock Creek, Service Creek, Spray, Wall Creek, Willow Creek, and Winlock.
Keywords: Historical document/Umatilla NF/Heppner Working Circle/Forest management/Blue Mountains.

564. **Parsons, William**. **No date**. History of Umatilla and Morrow Counties, Oregon. [Place of publication unknown]: W. H. Lever. 581 p. **Notes**: An original copy, but in very poor condition.
Abstract: This massive volume provides a comprehensive early history of Umatilla and Morrow Counties. It describes the early Euro-American settlements in those counties, and also includes a surprising amount of information about the American Indians and their way of life. Much of the material in this history was based on records from local newspapers, specifically the East Oregonian and the Pendleton Tribune in Pendleton, and the Heppner Gazette and Heppner Times in Heppner. The manuscripts were reviewed by a citizen panel of pioneers from each county before their publication. Umatilla and Morrow counties were written separately and published in a single volume. The book begins with a condensed history of Oregon (first eleven chapters), followed by Umatilla County's history (chapters 12 through 20). The second half of the volume is Morrow County's history. The volume contains abundant illustrations in the form of black-and-white photographs.
Keywords: Eastern Oregon/Historical document/Oregon history/Oregon Trail/Range history/Forest history/Umatilla County OR/Morrow County OR.

565. **Patterson, J. E. 1929**. The pandora moth, a periodic pest of western pine forests. Technical Bulletin No. 137. Washington, DC: U.S. Department of Agriculture. 20 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the pandora moth, an important insect defoliator of ponderosa pine forests, by covering the following topics: identity; descripion of the egg, larva, pupa, and adult; hosts and distribution; nature and extent of injury; biology; natural enemies; and control methods. Most of the information in this bulletin is based on studies conducted during a pandora moth outbreak in southern Oregon on the Klamath Indian Reservation between 1918 and 1925. This document includes some cultural information about pandora moth – it is interesting that most of the life stages of this insect were used for food by American Indians. The Klamath and Modoc tribes dug up the pupae (called "bull quanch"), whereas the Piute tribe gathered and dried the mature caterpillars and combined them with vegetable-type plant materials in a stew-like dish called "peage."
Keywords: Pandora moth/Ponderosa pine/Klamath Indian Reservation/Southern Oregon/Insect damage/Historical document.

566. **Pearson, G. A. 1920**. Factors controlling the distribution of forest types. Ecology. 1 (3): 139-159; 289-308.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Observers of plant life in the western mountains noted that forest types (types have the same connotation as associations in this article) were arranged in a specific pattern associated with altitudinal zonation. The presence or absence of certain types at certain altitudes was related to the temperature, moisture, and other factors prevailing

on those sites. The ecological relationships resulting in vegetational zonation are discussed in this article; they are based on studies conducted in the San Francisco Mountains of northern Arizona. This article includes the following sections: introduction; physical characteristics of the forest types: temperature, precipitation, wind and evaporation, and soil (origin and general character, moisture, temperature); determination of factors limiting the distribution of forest types: pinon-juniper type, yellow pine type, Douglas fir type (Douglas fir, limber pine), Engelmann spruce type (Engelmann spruce, cork bark fir, bristle cone pine); conclusions; and summary. Pearson noted that trees normally occurring at high altitudes had relatively high moisture requirements and low temperature requirements, while those occurring at low altitudes had relatively low moisture requirements and high temperature requirements. These conclusions were believed to be approximately correct, but perhaps they were not indicative of cause-and-effect relationships – when certain tree species were found on warm sites, was it because of a physiological requirement for high temperatures or because they were best adapted to tolerate them? To answer that question, the Forest Service established studies in various parts of the western United States in a project called "The Study of Forest Types." Five forest types (zones) were recognized in this study: pinon-juniper, dominated by oneseed juniper, Utah juniper, and pinyon pine; yellow pine, featuring western yellow (ponderosa) pine; Douglas fir, comprised of Douglas-fir, limber pine, white fir, and quaking aspen; Engelmann spruce, dominated by Engelmann spruce, corkbark fir, bristlecone pine, and quaking aspen; and alpine, composed of trailing (krummholz) forms of Engelmann spruce and bristlecone pine. This study came to the following conclusions: the weight of evidence supported the hypothesis that the upper altitudinal range of all tree species in the region was controlled by low temperatures, and the lower range by deficient moisture; air temperatures in the San Francisco Mountains decreased rather uniformly with increases in altitude; precipitation increased rapidly with altitude up to the Douglas-fir zone; wind movement was typically greatest at the highest elevations; evaporation data was not consistently related to altitude, although the highest evaporation occurred in the pinon-juniper type and the lowest in the Engelmann spruce zone; and there were several general soil types in the study area as based on their geological parent material.
Keywords: Forest types/Historical document/Land classification/Arizona/Bristlecone pine/Engelmann spruce/Forest ecology/Oneseed juniper/Limber pine/Montane zone/Foothills zone/Plant ecology/Ponderosa pine/Rocky Mountain Douglas-fir/Subalpine zone/White fir/Pinyon pine/Corkbark fir/Quaking aspen/Utah juniper/San Francisco Mountains/Vegetational zonation.

567. **Pearson, G. A. 1907**. Grazing lands by life zones. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Wallowa National Forest]. 15 p.
Notes: A digital version of this report is available; filename: Wallowa5. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes grazing resources and conditions for four life zones as classified by Merriam: the transition zone, characterized by ponderosa pine; the Canadian zone, characterized by lodgepole pine; the Hudsonian zone, characterized by subalpine fir; and the Arctic zone, characterized by an absence of forest growth. Forest and grassland conditions are described for each zone, including a discussion of the primary plants found in the zone and their suitability as livestock forage. This report provides good ecological insights into vegetational zonation as found on the Wallowa NF.
Keywords: Historical document/Forest ecology/Range management/Wallowa NF/Blue Mountains/Vegetational zonation.

568. **Pearson, G. A. 1912**. The influence of age and condition of the tree upon seed production in western yellow pine. Circular 196. Washington, DC: U.S. Department of Agriculture, Forest Service. 11 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This short circular covers the following topics: tests on western yellow pine seed; germination; yield; and application of study conclusions. Some important conclusions were: seed from young trees shows a higher germination than seed from old, mature, or overmature trees; certain injuries decrease while others increase seed quality; yellow pine marked by fire scars shows a germination 15 percent above that of healthy yellow pine; mistletoe-infected blackjack shows a germination 17 percent below that of unaffected blackjack; the effect of suppression is not clearly demonstrated on seed germination; the highest quality of seed is produced in dense stands; average seed yields were 1.8 bushels per tree for yellow pines and 1 bushel per tree for blackjacks; there was only a slight difference in cone production between healthy and unhealthy pines; yield from suppressed trees or those attacked by bark beetles or mistletoe was much less than that from normal trees; and seed yield decreases as stand density increases.
Keywords: Ponderosa pine/Cones/Seed crops/Historical document.

569. **Pearson, G. A. 1923**. Natural reproduction of western yellow pine in the southwest. Bulletin No. 1105. Washington, DC: U.S. Department of Agriculture. 143 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.

Abstract: This bulletin describes a study that was designed to determine the measures that are necessary to secure natural regeneration in the ponderosa pine forests of Arizona and New Mexico. The results of previous studies are reviewed, as are prior accomplishments in the study being described. The following factors affecting ponderosa pine regeneration are analyzed: seed supply, climate, soil, herbaceous vegetation, cutting, brush disposal, grazing, and miscellaneous enemies (fire, insects, diseases, and rodents). Good illustrations and photographs are included in this bulletin.
Keywords: Ponderosa pine/Natural regeneration/Southwestern United States/Arizona/New Mexico/Historical document.

570. **Pearson, G. A. 1910**. Reproduction of western yellow pine in the Southwest. Circular 174. Washington, DC: U.S. Department of Agriculture, Forest Service. 16 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This short circular covers the following topics with regard to management of western yellow pine in Arizona and New Mexico: factors that influence reproduction, including climatic conditions, cutting methods, brush disposal, grazing, and fires; and management.
Keywords: Ponderosa pine/Southwestern United States/Arizona/New Mexico/Forest management/Historical document.

571. **Pearson, G. A. 1914**. The role of aspen in the reforestation of mountain burns in Arizona and New Mexico. The Plant World. 17 (9): 249-260. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article discusses forest succession after burns in the southwestern United States. At mid to high elevations in the mountains, burns are either followed by a seral stage of aspen, or they lack a tree cover altogether. When aspen does occur, it often serves as a nurse crop and facilitates regeneration of Engelmann spruce, subalpine fir, white fir, or Douglas-fir, all of which require some cover or shade for establishment. The author then describes the autecology of aspen, noting that it reproduces almost entirely by root suckers and that some burns within aspen's elevational range are not restocked by this species. Some possible reasons for the absence of aspen are disclosed, although no definitive reason is given. An experiment in the San Francisco Mountains of northern Arizona is then described. Douglas-fir seedlings were planted beneath aspen stands and in adjacent openings to compare their survival and development. Survival was higher under the aspen, with most of the losses in the open being obviously due to drought. The light shade found under an aspen overstory resulted in lower transpirational losses of soil moisture, which is assumed to be the main reason for higher seedling survival on the aspen plots. The author admits that ponderosa pine seedlings could probably have handled the environmental conditions found in the openings better than Douglas-fir, and should have been used there. He recommends that high elevation plantings of Engelmann spruce be made under aspen since spruce is even less tolerant of sunlight than Douglas-fir.
Keywords: Arizona/Artificial regeneration/Fire ecology/Fort Valley Experiment Station/Historical document/Engelmann spruce/Natural regeneration/Plant succession/Quaking aspen/Rocky Mountain Douglas-fir/Nurse crop/ Southern Rocky Mountains.

572. **Pearson, G. A. 1913**. What is the proper basis for the classification of forest land into types? Proceedings of the Society of American Foresters. 8: 79-84. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article discusses the factors that should be used to delineate forest types. The principal factors that determine the character of a forest are heat, light, and moisture, which are controlled indirectly by such things as altitude, topography, slope, aspect, climate, and so forth. Since climate and other types of environmental data are generally lacking for most wildland areas, the author recommends that trees and other plants be used as indicators of site conditions. At the time this article was prepared, lands within the newly-created National Forest System were still being evaluated for their retention as forest land, or for disposal because of agricultural potential. Pearson uses his recommendations about vegetational indicators to demonstrate how agricultural lands could be identified within forested environments.
Keywords: Forest types/Historical document/Land classification.

573. **Peavy, George W. 1911**. The forests of Oregon: their importance to the state. Bulletin No. 1. Salem, OR: Oregon Agricultural College, Oregon State Board of Forestry. 23 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper. This bulletin was revised in 1922 and reissued as Bulletin No. 2.
Abstract: This early bulletin describes the forest resources of Oregon. The following topics are discussed: forestry: what it is, the government land policy, the increasing value of timber, our wood-using industries, the present and future value of Oregon's forests, the people's interest, protecting the forests, the state forestry law, and forestry facts you should know.
Keywords: Historical document/Forest history/Forest management/Oregon.

574. **Peavy, George W. 1922**. Oregon's commercial forests: their importance to the state. Bulletin No. 2. Salem, OR: Oregon State Board of Forestry. 80 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper. This bulletin is a revision of one issued in 1911 as Bulletin No. 1.
Abstract: This long bulletin describes the forest resources of Oregon. The following topics are discussed: history of forest depletion, progress of forest removal, Pacific Coast forests, Oregon's future as a timber producing state, a perpetual forest industry, descriptions of important tree species, the farmers' woodlot, species suited to wood lots, a forest policy for Oregon, federal activities, federal and state cooperation, state activities, Oregon's forestry laws, and forest facts.
Keywords: Historical document/Forest history/Forest management/Oregon/Western larch/Western juniper/Grand fir/Western white pine/Lodgepole pine/Douglas-fir/Ponderosa pine.

575. **Peck, Morton E. 1925**. A preliminary sketch of the plant regions of Oregon. II. The Cascade Mountains and eastward. American Journal of Botany. 12 (2): 69-81. **Notes**: A photocopy of an original.
Abstract: Part I of this 2-part series dealt with six plant regions found in Oregon west of the Cascade Mountains. This second part deals with the Cascade Mountains region and all of eastern Oregon. The Cascade region included the entire Cascade Mountain range within the state of Oregon. The boundaries of the Cascade region were least well defined in the southern part of the state, where the mountains fell away abruptly and tended to merge with the Klamath Mountains. The surface of this region consisted of lava flows, with the older flows being on the western side where deep soils developed, and the newer flows on the eastern side where many areas had either no soil or just a vestige of soil development. The highest part of the Cascade region lies near its eastern border so that it presents a very long westward slope that served to lift the prevailing storm systems gradually, thereby creating a strong precipitation gradient from west to east. The Cascade region had several vegetation zones represented, with the lowest one being the transition zone. It was characterized by mixed-conifer forests containing grand fir, Douglas-fir, western red cedar, and western hemlock. The next highest zone elevationally was the Canadian zone, which was characterized by broken topography, steeper slopes, and forests dominated by western white pine, lodgepole pine, noble fir, grand fir, Douglas-fir, and western hemlock. Above the Canadian zone was the Hudsonian zone. It occurred from the Canadian zone to upper treeline, being dominated by forests of mountain hemlock, whitebark pine, Alaska yellow-cedar, subalpine larch, subalpine fir, and shasta red fir. Above the Hudsonian zone was the arctic-alpine zone featuring treeless environments dominated by a few low-growing shrubs and numerous herbaceous plants. The eastern Oregon region contains a large percentage of the state. Peck defined several areas within the eastern Oregon region: the Columbia River area, the yellow pine area, the bunch-grass area, the lake area, and the sagebrush area. The third and final region was the Blue Mountain region, which also included the Wallowa Mountains. This region was defined as the area above the upper limit of the yellow pine area described for the eastern Oregon region. Forests in this region were characterized as "more or less open, a fact due to the rather low precipitation. There is nowhere anything to compare with the magnificent forests of the Cascades." Although a large proportion of the plants in the Blue Mountain region also occurred in the Cascades, there was also a considerable Rocky Mountain element with a number of endemic species.
Keywords: Botany/Cascade Mountains/Blue Mountains/Eastern Oregon/Forest ecology/Historical document/Plant communities/Vegetational zonation/Wallowa Mountains.

576. **Pernot, J. F. 1913**. The 1913 infestation of *Dendroctonus monticolae*. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 1:126,720; [Projection unknown]; 33" x 38"; Thematic. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This map accompanies a report called "The insect situation in 1913 on the Whitman National Forest" (see Pernot 1913 in the History Archives). The base map, which shows the entire Whitman NF, was compiled from Supervisor's [Office] corrected atlas sheets in Portland, Oregon in April of 1912 by draftsman R. H. Robertson. The legend for the base map includes the following items: National Forest boundary; Ranger District boundary; stock driveways; county lines; telephone lines; Forest Service trails; old trails; Ranger Station fences; Ranger cabins; and fire tool boxes. The legend for the thematic map includes three items: exterior limits of heavy areas of infestation prior to, and including 1912, according to map of Ranger Smith; areas of active infestation in lodgepole pine, noted in 1913; and areas of active infestation in yellow pine, noted in 1913.
Keywords: Bark beetles/Dendroctonus/Historical map/Insect damage/Lodgepole pine/Mountain pine beetle/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains.

577. **Pernot, J. F. 1913**. Insect control policy for District 6. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 14 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Beginning in 1912, the responsibility for combating insect infestations on the national forests was as-

sumed entirely by the U.S. Forest Service. Prior to then, such work had been performed primarily by the Bureau of Entomology. Based on the Bureau's previous work, some information was available about the identity and life histories of major forest insects. Control methods, at least at the theoretical level, had also been formulated. However, the fundamental relationships associated with the development and control of broad-scale infestations was still largely unknown when this paper was written. It summarizes what was known of the insect situation for District (Region) 6 of the Forest Service in 1913. In particular, this report recapitulates what had been learned as a result of recent mountain pine beetle and western pine beetle outbreaks in the Blue, Wallowa, Ochoco, and Paulina Mountains of eastern Oregon. Studies had already shown that mountain pine beetle was a regular component of the forest ecosystems in those areas, occasionally becoming abundant enough to kill lodgepole pines over extensive acreages. East of the Cascade Mountains, it had been observed that mountain pine beetle and lodgepole pine seemed to coexist in some sort of symbiotic relationship. Minor infestations of mountain pine beetle had also been observed in yellow (ponderosa) pine, but certainly not to the extent as for lodgepole pine. Mountain pine beetle was also active in western white pine (northeastern Washington) and whitebark pines (northeastern Oregon). It was also noted that mountain pine beetle operated in eastern Oregon differently than had been expected – rather than beginning as a localized infestation and then radiating outward from there, it appears that the beetle was widely distributed throughout the host type and would increase simultaneously over a broad region under favorable conditions. This realization had important implications for control programs since it had been thought that a major outbreak could be checked by controlling locally heavy infestations, thereby preventing the outward spread. The reason that many control operations had fallen short of their objective was that beetles were increasing outside of the control areas independently of any control measures. It had also been noted that outbreaks tended to subside naturally, although the causal mechanisms or agents for natural collapse or subsidence were not understood. On the Wallowa NF, for example, the first serious mountain pine beetle outbreaks were reported in 1905, continuing to grow to a peak in 1910, and then collapsing to quiescent levels by 1912. Another outbreak occurred not 25 miles away in the Powder River valley on the Whitman NF, beginning in lodgepole pine stands in 1906. It increased rapidly for the next 5 years, apparently culminating in 1912. As it culminated in lodgepole, the beetle began working in mixed stands of lodgepole and yellow pine, eventually killing considerable numbers of yellow pine trees. As of 1913, large infestations were known to exist on the Malheur and Umatilla NFs, although they had not been studied to the same extent as the Whitman and Wallowa outbreaks. As of 1913, four extensive control projects had been completed – two on the Whitman NF in cooperation with the Bureau of Entomology, and two on the Ochoco National Forest (Badger Creek drainage) under the direction of the Forest Service alone. The 1911 control project on the Whitman NF covered an area of 84,330 acres, costing $23,582, and resulting in the treatment of 15,170 lodgepole pines (cut and burned), 8,015 yellow pines that were cut and treated, and 3,388 yellow pines that were treated by peeling them standing. A gradual cessation of insect damage in untreated portions of the Forest indicated that the post-treatment declines were due more to natural factors than any direct result of the control operations. One observation of the eastern Oregon outbreaks was that mountain pine beetle always became a problem in the lodgepole pine type first, occasionally spilling out from there to infest adjacent or intermingled yellow pines. Extensive outbreaks had never been observed in pure stands of western yellow pine. On six national forests in eastern Oregon, it was estimated that approximately one million acres had been affected by mountain pine beetle outbreaks in the 10 or 12 years before this report was written. Based on what was learned from the control efforts of 1910-1913, it was recommended that no large projects occur in the future, at least where the outbreak was confined mainly to the lodgepole pine type. Future control efforts should only be initiated when warranted by the value of the timber being threatened. The report ends with a few observations about western pine beetle, noting that it was widespread in mature and decadent stands of the yellow pine type, but not causing great damage in any particular area.
Keywords: Bark beetles/Blue Mountains/Dendroctonus/Eastern Oregon/Historical document/Insect control/Insect damage/Insects/Lodgepole pine/Malheur NF/Minam NF/Mountain pine beetle/Northeastern Oregon/Ochoco NF/Paulina NF/Ponderosa pine/Umatilla NF/Wallowa NF/Western pine beetle/Western white pine/Whitebark pine/Whitman NF.

578. **Pernot, J. F. 1913**. The insect situation in 1913 on the Whitman National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 13 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: During July and August of 1913, a study was made of the insect infestations on the Whitman National Forest. The main objective of the investigation was to examine the progress and status of an on-going mountain pine beetle outbreak, and to determine if further insect control operations were warranted. This report includes the following sections: introduction; the infestation of the mountain pine beetle (distribution, occurrence, condition of the broods), the western pine beetle *(Dendroctonus brevicomis)*; the Douglas fir beetle *(Dendroctonus pseudotsugae)*; and the western larch borer *(Tetropium velutinum)*. At the time this report was written, mountain pine beetle was found wherever lodgepole pine occurred. The distribution of the beetle followed so closely the range of lodge-

pole pine that it could be considered a lodgepole pine beetle, at least in the Blue Mountains. In 1913, the infestation on the Whitman NF was centered on the Anthony Lakes area, the entire headwaters area for the North Powder River, the upper watersheds of the Grande Ronde River, and the upper watersheds of the North Fork of the John Day River, especially in Crawfish Creek, on upper Trail Creek, and on Trout Creek and in the vicinity of Trout Meadows. The Crane Creek and Crane Flats areas, which are southern tributaries of the North Fork of the John Day River, were also heavily infested. On a sample acre near Anthony Lakes, the stand consisted of lodgepole pine, Engelmann spruce, and subalpine fir, with lodgepole pine comprising 83% of the stand. Of the 194 lodgepole pines per acre in the 6 to 13 inch diameter class, 47% had been killed in the last 3 years, 35% were infested in August of 1913 with the 1912-1913 brood of beetles, and 18% were healthy and not attacked. The occurrence of mountain pine beetle in whitebark pine was irregular and very scattered. Trees along the summit of the North Fork of the John Day – Powder River divide were infested, as were some on the summit of Bald Mountain. In 1913, there was little or no mountain pine beetle infestation in yellow (ponderosa) pine, with limited tree killing noticed in that species in the North Fork of the John Day River drainage and in the Crane Creek area. Western pine beetle was noted throughout the yellow pine zone on the Forest, causing regular and steady losses each year. It was estimated that at least one yellow pine was killed by western pine beetle in mature or decadent stands each year. Many of the attacked trees had been weakened by another factor first, such as lightning, fire, drought, or decay. Douglas-fir beetle was active in mixed-conifer stands, especially in the area near White Pine and Austin, Oregon. The western larch borer was considered to be partly responsible for the death of a considerable percentage of the mature western larch in the Blue and Wallowa Mountains of northeastern Oregon. It was noted that dwarf-mistletoe infections were particularly severe in mature larches, and that the borer was found most abundantly in the mistletoe-weakened trees. A map also accompanied this report (also authored by Pernot in 1913); see the historical documents database for further information.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa-Whitman NF/Whitebark pine/Whitman NF/Blue Mountains/Douglas-fir beetle/Western pine beetle/Larch dwarf mistletoe/Western larch borer.

579. **Peters, J. Girvin**. **1913**. Forest fire protection under the Weeks Law in cooperation with states. Circular 205. Washington, DC: U.S. Department of Agriculture, Forest Service. 15 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This short circular covers the following topics: fire prevention and control; the Weeks law, section 2; administration of the law; terms of the cooperative agreement; work done in 1912; results accomplished; extending cooperative protection. An appendix contains a sample cooperative agreement, and an example of a fire-plan map.
Keywords: Weeks law/Fire prevention/Forest fires/Fire control/Historical document.

580. **[Photographer unknown]**. **[Date unknown]**. Actively burning forest fire. Photo Number 228315. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 3” x 5½”.
Notes: An original copy.
Abstract: This is a black-and-white photograph of high quality; the image is in sharp focus throughout. This photograph depicts a forest fire or slash burn. It appears from the vegetation types and the general geographical features that it may have been acquired near Desolation Lookout on the North Fork John Day Ranger District. The foreground view shows dense stands of mixed-conifer forest, with several ponderosa pines clearly distinguishable. Most of the middleground scene shows a white cloud from a forest fire that has apparently been moving from the photo’s lower left corner toward the middle of the view. The background shows a round-topped summit covered with forest, although a few talus slopes or mountain meadows can also be discerned.
Keywords: Historical photograph/Umatilla NF/Mixed-conifer forest/North Fork John Day RD/Forest fires.

581. **[Photographer unknown]**. **1939**. Butter Creek fire area on August 7, 1939. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Butter Creek. **Size**: 3½” x 6”.
Notes: Original copies, including the negatives.
Abstract: These are black-and-white photographs of moderate to poor quality; some of the images are in sharp focus, whereas others are not. There is no information provided for this accession other than a typescript label stating “Butter Creek Fire August 7, 1939.” The photographs depict what is apparently severe damage from an August wildfire. Although it is not known if the August 7, 1939 date refers to the fire or when the images were acquired, it is obvious that the photographs were taken shortly after the fire was out. The fire burned in a mixed-conifer forest with a variety of stand types. Some areas are dense stands with a mix of conifers, while others are fairly open stands of ponderosa pine. In many instances, it appears that this fire was a stand-replacement event because few green trees are in evidence. Stumps are visible in several photographs, indicating that some portions of the area had been partially cut prior to the fire. Several images include vehicles or logging equipment from that era, including

primitive crawler tractors and logging arches. Note: this accession also includes the negatives. All of the prints and negatives are stored in archival-quality vinyl pages designed for 3” x 5” prints. Nine of the negatives do not have prints made; several of those negatives appear to have useful images and it would be advisable to get prints made from them at the first opportunity to do so.
Keywords: Historical photograph/Umatilla NF/Fire damage/Fire effects/Forest fires/Mixed-conifer forest/Ponderosa pine/Logging equipment/Butter Creek fire.

582. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 1. Photo Number 24986 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Klondike Ridge near Pearson Creek. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 1 in the series; it appeared on page 82 of Kellogg’s folio. Its caption is: “In T. 3 S., R. 33 E., on Klondike ridge looking west across Pearson Creek.” In the foreground is lichen-encrusted rock as one would expect for a ridge. The middleground shows a mixed stand of Douglas-fir and ponderosa pine. The background shows a long gentle ridge with side canyons running toward the viewer; background vegetation is a mix of moderate to dense forest cover intermixed with open areas that are apparently scablands or dry meadows. Unfortunately, the background portion of the photo is not as clear as the foreground and appears to have faded appreciably with time.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Scabland/Ponderosa pine/Rocky Mountain Douglas-fir/Klondike Ridge/Pearson Creek.

583. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 10. Photo Number 24993 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 9 in the series; it appeared on page 84 of Kellogg’s folio. Its caption is: “In T. 3 S., R. 33 E., on sheep driveway, showing importance of vegetation in holding soil together.” The foreground area shows the culms of a sparse to moderately-dense stand of grass. The middleground shows an area that still has soil, but was obviously overgrazed or used a bedding area by the sheep. In the exact center of the photograph, there is apparently a man in hairy chaps standing within the crown of a bushy ponderosa pine tree. There are many decadent shrub clumps, one of which is quite large, in the middleground of this photo. The shrub clumps may possibly be mountain mahogany, although it is difficult to say for sure since they were without foliage when the photograph was acquired. There are two ponderosa pine trees in the left portion of the middleground/background, a rounded, bushy pine in the center of the middleground, and the tops of other trees are barely visible in the background.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Ponderosa pine/Grazing damage/ Scabland/Mountain mahogany/Sheep grazing.

584. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 11. Photo Number 24985 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land clas-

sification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 11 in the series; it appeared on page 85 of Kellogg’s folio. Its caption is: “In T. 3 S., R. 33 E., showing erosion of soil which follows after removal of vegetation.” In the foreground is a heavily trampled area devoid of vegetation, bisected by a gully that appears to be from 2 to 3 feet deep at its center. The middleground shows cured bunchgrass (the photograph was apparently taken in very early spring or late fall). The background shows a rider on a horse; the rider is wearing light-colored chaps. There are two clumps of what appear to be small ponderosa pines to the right side of the middleground and background portions.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Grazing damage/Scabland/Ponderosa pine.

585. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 12. Photo Number 24994 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 12 in the series; it appeared on page 85 of Kellogg’s folio. Its caption is: “In T. 3 S., R. 33 E., on stock driveway showing part of open level ridge fringed with timber.” In the foreground is a very heavily trampled area devoid of vegetation, with surface rocks present in the open middleground area. The background consists of a fairly dense tree stand comprised mostly of ponderosa pine, which occurs in a variety of tree sizes. Some downed woody material is apparent at the edges of the forested area. In the left background, there is apparently a clump of mountain mahogany or another species of mid to tall shrub. In the exact center of the photograph is a Forest Service Ranger’s hat (Smokey Bear type) lying on the ground, apparently placed there for scale purposes.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Grazing damage/Scabland/Stock driveway/Ponderosa pine/Mountain mahogany.

586. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 13. Photo Number 24988 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 13 in the series; it appeared on page 85 of Kellogg’s folio. Its caption is: “Twisted western yellow pine in T. 3 S., R. 33 E., on stock driveway showing effect of shallow rocky soil on tree development.” In the foreground is a very heavily trampled area devoid of vegetation, with small surface rocks present throughout that area. The middleground shows a large-diameter ponderosa pine with several main stems and a twisted growth form. The background shows a fairly dense tree stand comprised mostly of ponderosa pine, with scattered representation of Douglas-fir and grand fir. Some downed woody material is apparent in the middleground area, as are two clumps of what apparently is mountain mahogany or another species of mid to tall shrub. The shrub clump on the

right appears to have been heavily grazed or browsed.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Grazing damage/Scabland/Stock driveway/Ponderosa pine/Mountain mahogany.

587. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 2. Photo Number 24987 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Meadow Creek. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 2 in the series; it appeared on page 82 of Kellogg's folio. Its caption is: "In T. 3 S., R. 33 E., looking east down Meadow Creek showing slopes well forested with western yellow pine, western larch, and lodgepole pine." In the foreground is an open area with a moderate amount of small, downed wood on the ground. The middleground includes a stand of moderately tall snowbrush ceanothus under a young stand (large saplings or small poles) of lodgepole and/or ponderosa pines. The background shows dense mixed-conifer stands that are characteristic of the northern and central Blue Mountains. Both middleground and background portions show open areas that are apparently scablands or dry meadows. The area depicted in this photo is apparently now administered by the Wallowa-Whitman NF, La Grande Ranger District.
Keywords: Historical photograph/Scabland/Ponderosa pine/La Grande RD/Lodgepole pine/Meadow Creek/Mountain meadows/Wallowa-Whitman NF/Snowbrush ceanothus.

588. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 3. Photo Number 25620 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Lookout (Tower) Mountain. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 3 in the series; it appeared on page 82 of Kellogg's folio. Its caption is: "View taken from Lookout Mt. in T. 6 S., R. 34 E., looking northeast across the watershed of Little Fly and Sheep Creeks." In the foreground is a rocky area devoid of vegetation, which appears to be the rocky summit of a basalt ridge. The middleground and background areas show undulating ridges covered with forests. One portion of the middleground shows an area that was apparently burned or defoliated at some point, since it seems to be comprised chiefly of standing dead trees at the time the photo was taken. The top of a dead tree can also be seen in the foreground, just below the ridgeline. This photo was apparently taken in the general vicinity of Tower Mountain and it is likely that Lookout and Tower Mountains are one and the same. The area included in the background would include portions of the 1994 Boundary wildfire.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Grazing damage/Scabland/Ponderosa pine/Tower Mountain/Lookout Mountain/Boundary wildfire.

589. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 4. Photo Number 25619 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Lookout (Tower) Mountain. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each

photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 4 in the series; it appeared on page 82 of Kellogg's folio. Its caption is: "View taken from Lookout Mt. in T. 6 S., R. 34, looking northwest across Lookout Cr. showing spur extending to north." In the foreground is lichen-encrusted rock and open stands of Douglas-fir and subalpine fir, as one would expect from a ridgetop perspective. The middleground shows mixed-conifer stands, including a good representation of dead trees. The background shows relatively dense mixed-conifer stands with abundant dead trees and small areas (upper right in photo) that appear to be old fire scars. The middleground and background views also show open areas that are apparently scree slopes or rock outcrops. The background area in this photo is apparently now administered by the Wallowa-Whitman NF, La Grande Ranger District.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Tower Mountain/Lookout Mountain/La Grande RD/Wallowa-Whitman NF/Subalpine fir/Lookout Creek/Mixed-conifer forest.

590. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 5. Photo Number 24989 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Bear Wallow. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 5 in the series; it appeared on page 83 of Kellogg's folio. Its caption is: "In T. 3 S., R. 33 E., looking north at lodgepole pine stand characteristic of the Bear Wallow watershed." In the foreground is a road or heavily-grazed area that is totally devoid of vegetation. The middleground shows a mature stand of lodgepole pine, with an abundance of dead trees on the ground. There is also a rider and horse in the exact center of the middleground. The background clearly depicts the density and crown characteristics of the lodgepole pine stand.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Lodgepole pine/Bear Wallow Creek.

591. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 6. Photo Number 24990 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 6 in the series; it appeared on page 83 of Kellogg's folio. Its caption is: "In T. 3 S., R. 33 E. Uprooted western yellow pine on Driveway No. 6, showing shallow root system due to shallow and rocky nature of soil." In the foreground is a scabland environment totally devoid of vegetation. The middleground shows a mature western yellow (ponderosa) pine that was windthrown quite a few years before the picture was taken. The root system of the downed tree was shallow and incorporated many large rock fragments, which is not unexpected for a tree growing on a scabland. The middleground area shows less surface rock than the foreground area, but it was heavily trampled and apparently had sustained overgrazing for a long period. Several shrubs (mountain mahogany?) can also be discerned near the forest edge. The background clearly shows a mixed-conifer stand, with both ponderosa pines and Douglas-firs apparent in the scene. There are also quite a few dead trees in the background forest.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Ponderosa pine/Rocky Mountain Doug-

las-fir.

592. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 7. Photo Number 24992 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 7 in the series; it appeared on page 83 of Kellogg’s folio. Its caption is: “In T. 3 S., R. 33, along stock driveway showing rocky nature of soil and importance of vegetation in preventing soil erosion.” In the foreground is a scabland or rock field environment totally devoid of vegetation. The middleground shows more rocky area and two horses without riders. The background shows the crowns or tops of ponderosa pine trees and one large clump of mid-height shrubs, perhaps mountain mahogany although it is hard to tell since the photo was taken when there was no foliage on the deciduous species. One portion of the background depicts an open, non-rocky area that apparently supports bunchgrasses, although the grasses are closely cropped and appear to have been heavily grazed.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Ponderosa pine/Grazing damage/Scabland/Mountain mahogany.

593. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 8. Photo Number 24996 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4” x 5” negatives and 8” x 10” prints for each image. This item is photograph number 8 in the series; it appeared on page 84 of Kellogg’s folio. Its caption is: “In T. 3 S., R. 33, on Driveway No. 5. The faint tracks to the right indicate the location of an old road abandoned when soil was worn away, exposing rock, and new road to left used. This will eventually wear down to the underlying bedrock.” In the foreground is a scabland environment totally devoid of vegetation. There is a set of moderately-deep ruts in the exact center of the photo that represent the old road mentioned in the caption. The new roadbed is located in the left side of the photo. The middleground shows more rocky area. The background shows a horse and rider (rider in light-colored chaps) and a forest scene with numerous shrub clumps (perhaps mountain mahogany, as they seem too large for *Ribes*), a few old-growth ponderosa pine trees, a rapidly-growing grand fir tree, numerous young-growth ponderosa pines (large poles or sawtimber-sized trees), and a few mid-sized western juniper trees. Once again, it is somewhat difficult to infer the condition of the shrub plants since the photo was taken at a time of year when the shrubs were without foliage, probably in very early spring.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Ponderosa pine/Grazing damage/Scabland/Mountain mahogany.

594. **[Photographer unknown]**. **1916**. Eastern Division, Umatilla extensive classification, No. 9. Photo Number 24995 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8” x 10”; original was 5” x 7”. **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, “Land classification of the Umatilla National Forest, Oregon” for more information). Kellogg’s land classification folio included six 18” x 21” sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each

photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 9 in the series; it appeared on page 84 of Kellogg's folio. Its caption is: "In T. 3 S., R. 33, on stock driveway. Old stump of tree remaining to show how the tree prevented the earth from washing away." The entire foreground area consists of angular surface rock with little or no intermixed soil. The middleground shows a man standing behind a small hummock with a ponderosa pine stump in its center. The area immediately surrounding and behind the stump still has soil and there is no surface rock apparent. The man is a young or early middle-aged man and seems to be the same one that was wearing light-colored chaps and appeared in many of the other photographs (perhaps it is F. B. Kellogg?). The background shows a moderately-dense mixed-conifer stand that is representative of many areas in the central and southern Blue Mountains. Several large-diameter ponderosa pines are visible, especially near the timber/meadow edge. There are also two riderless horses (with saddles and tack) standing in the background; presumably they belong to the man near the stump and the photographer. The background also shows at least 4 mid to tall shrub clumps, possibly of mountain mahogany although it is difficult to say for sure since they were without foliage when the photograph was acquired.
Keywords: Umatilla NF/Historical photograph/North Fork John Day RD/Ponderosa pine/Grazing damage/Scabland/Mountain mahogany.

595. **[Photographer unknown]**. **[Date unknown]**. Fremont power house and power line. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 9 S., R. 35 E., sec. 9. **Size**: 7" x 11".
Notes: An original copy.
Abstract: This is a high-quality, sepia-tone photograph, with almost all areas of the print in sharp focus. It was taken near the Fremont power house, which is an important structure in the Fremont Historic District on the North Fork John Day Ranger District. The power house was important for generating and distributing electrical power for the Red Boy mine and other mines in adjacent mining districts. This photograph was taken from a high vantage point looking down toward the power house itself. It was taken in winter when the snowpack was fairly deep. A dense stand of mixed conifers is shown in the background; a power line corridor occupies the exact center of the background view.
Keywords: Historical photograph/Umatilla NF/Fremont power house/North Fork John Day RD/Fremont Historic District/Red Boy mine.

596. **[Photographer unknown]**. **[Date unknown]**. Fremont power line on ridgeline. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 9 S., R. 35 E., sec. 9. **Size**: 7" x 11".
Notes: An original copy.
Abstract: This is a high-quality, sepia-tone photograph, with almost all areas of the print in sharp focus. It was taken near the Fremont power house, which is an important structure in the Fremont Historic District on the North Fork John Day Ranger District. The power house was important for generating and distributing electrical power for the Red Boy mine and other mines in adjacent mining districts. This photograph was taken from a high vantage point looking down toward the power house itself. It was taken in summer. In the foreground, a wooden power pole is dominant, although a large clump of snowbrush ceanothus is clearly distinguished at the base of the pole. The ceanothus appears to be in bloom. A dense stand of mixed conifers is present in the middleground view, although a regenerated clearcut with small seedlings is located near the base of the slope and to the right of the power house. The drainage (Congo Gulch) is also visible in the middleground scene. The background shows smooth mountain slopes supporting moderately dense mixed-conifer forest.
Keywords: Historical photograph/Umatilla NF/Fremont power house/North Fork John Day RD/Fremont Historic District/Red Boy mine/Congo Gulch/Mixed-conifer forest/Snowbrush ceanothus.

597. **[Photographer unknown]**. **[Date unknown]**. Godman Springs Forest Camp. Photo Number 162375. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 7 N., R. 40 E., sec. 10. **Size**: 4" x 6". **Notes**: An original copy.
Abstract: This is a black-and-white photograph of generally poor quality; the focus appears to be sharp, but contrast problems and blotchy areas are common throughout the image, apparently caused by deterioration of this print through time. Hand-written annotations on the back of this photograph are "Godman Springs Forest Camp – the timber belt has been laid off into summer home lots surrounding the more open ground – four large springs quite widely separated but all close to summit of ridge which here has flattened considerably furnish the water supply. Country is popular with people from Dayton Washington." A meadow area is depicted in the foreground and mid-

dleground areas; it looks to have been heavily grazed. The background shows a dense subalpine stand dominated by Engelmann spruce and subalpine fir.
Keywords: Historical photograph/Umatilla NF/Godman Springs/Pomeroy RD/Engelmann spruce/Mountain meadows/Subalpine fir/Summer homes/Dayton WA.

598. **[Photographer unknown]**. **[Date unknown]**. Homesteader's cabin and garden. Photo Number 23636A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Wenaha National Forest, Washington. **Size**: 4½" x 6½". **Notes**: An original copy.
Abstract: This is a black-and-white photograph of high quality; the image is in sharp focus throughout. The following information is provided on the card stock to which the image was attached: "23626A Homesteader's cabin and garden. Land taken under Act of June 11 1906. Wenaha National Forest Washington. Card stock designation: O, IMPROVEMENTS, Cabin. 23636A Homesteaders cabin and garden, land, taken under act of June 6, 1909. This photograph shows a foreground area that had been logged off and was then dominated by a mix of forbs and grasses, including an occasional false hellebore plant, indicating that the site was moist and had been overgrazed. Common yarrow can also be distinguished in the image. The middleground shows a fenced area near a log cabin; a horse is grazing right outside the cabin. The background shows a typical mixed-conifer forest of the northern Blue Mountains, with an abundance of overmature western larch and occasional Engelmann spruces and subalpine firs. Lodgepole pine is also present, including as an understory species in the area with an old larch overstory. An area in the middle of the background has obviously been harvested, although the entry was a partial cut with snags and some green trees left.
Keywords: Homestead/Historical photograph/Umatilla NF/Pomeroy RD/Wenaha NF/Engelmann spruce/Lodgepole pine/Subalpine fir/Western larch/Mountain meadows.

599. **[Photographer unknown]**. **[Date unknown]**. Looking south into Mottet Valley from a road near Bone Springs Mountain. Photo Number 247992. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [T. 5 N., R. 39 E., sec. 28]. **Size**: 4" x 6½". **Notes**: An original copy, although there is a small round hole near the right edge that was apparently caused by a three-hole punch.
Abstract: This is a black-and-white photograph of high quality; the image is in sharp focus throughout. Not much information is associated with this photograph. It shows an early Forest Service pickup (looks like a converted car from the 1930s) with something in the back covered with a canvas tarp. There is a Forest Service shield logo on the driver's side just in front of the front door. A Forest Service Ranger is leaning on the passenger side of the vehicle and looking off into the distance (presumably into the Mottet Valley according to the annotations). A vigorous, pole-sized grand fir tree is just to the left of the person. Most of the close middleground scene is comprised of an open area, with snowbrush ceanothus and bracken fern clearly distinguished in the plant community. The far middleground area is dominated by a dense, fairly young conifer forest consisting of western larch, Engelmann spruce, grand fir, and subalpine fir. The background view shows rows of long, continuous ridges, most of which support forest cover. One area of the background has what appears to be a timber harvest unit or an old burn.
Keywords: Historical photograph/Umatilla NF/Mottet Valley/Mixed-conifer forest/Walla Walla RD/Bone Springs Mountain.

600. **[Photographer unknown]**. **[Date unknown]**. North Fork John Day River in winter. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size:** 5" x 9".
Notes: An original copy.
Abstract: This is a high-quality, sepia-tone photograph, with most areas of the print in relatively sharp focus. It shows what is apparently the North Fork of the John Day River during winter, perhaps at a point northwest of Dale, Oregon. It was included in a collection of sepia-tone prints relating to the Fremont power house. The foreground of this photograph is dominated by the water in the river, with snow-covered floodplain or banks also present. The middleground also shows the river, with small-stature trees also present on both sides. The background shows the river canyon and its adjacent hillsides, with some of those areas open (non-forested) and other areas supporting forests occurring as stringers along drainages or stream courses.
Keywords: Historical photograph/Umatilla NF/North Fork John Day River/Mixed-conifer forest/Fremont power house.

601. **[Photographer unknown]**. **[Date unknown]**. Power line above Fremont power house. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 9 S., R. 35 E., sec. 9. **Size**: 7" x 11".
Notes: An original copy.
Abstract: This is a high-quality, sepia-tone photograph, with most areas of the print in relatively sharp focus. It was taken near the Fremont power house, which is an important structure in the Fremont Historic District on the

North Fork John Day Ranger District. The power house was important for generating and distributing electrical power for the Red Boy mine and other mines in adjacent mining districts. This photograph was apparently taken on a high ridgeline somewhere above the power house; the house itself is not visible in this image. The foreground scene is dominated by rock and the low-growing grasses and forbs commonly encountered on a high-elevation site. A dense stand of mixed conifers is present in the middleground view, which seems to be at a considerably lower elevation than the foreground scene (e.g., the scene is falling away rapidly from foreground to middleground). The background shows high-elevation mountain slopes supporting discontinuous subalpine forest and many areas of exposed rock or talus.
Keywords: Historical photograph/Umatilla NF/Fremont power house/North Fork John Day RD/Fremont Historic District/Red Boy mine/Mixed-conifer forest/Subalpine zone.

602. **[Photographer unknown]**. **1933**. Rodent control at Frazier Guard Station. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 5 S., R 33½ E., sec. 2. **Size**: 5" x 4".
Notes: An original copy, mounted on form R6-E13.
Abstract: This is a black-and-white photograph of moderate quality; the image is in sharp focus throughout the middleground and background portions but the immediate foreground is not in focus. The following information is provided on the paper form (R6-E13, a camera point form) to which the print is attached: "CPS#23. Rodent control at Frazier G.S. Date: Sept. 1933. Location: Frazier G. S. Photo No. 1. Light: fair. Description of scene: photograph of rodent control crew in Frazier G. S. pasture taken in Sept. 1933. No number. Person who took picture unknown." The foreground area shows withered forbs among sparse grass; the forbs appear to be mule's ears *(Wyethia amplexicaulis)*. The middleground is a flat dry-meadow area with a work crew scattered across it (7 individuals, presumably the rodent-treatment crew). The far background shows typical mixed-conifer forest in the Frazier area, with mature or overmature ponderosa pines clearly distinguished along with pointed-top Douglas-firs.
Keywords: Historical photograph/Umatilla NF/Mountain meadows/North Fork John Day RD/Ponderosa pine/Rocky Mountain Douglas-fir/Frazier Guard Station/Mule's ears/Rodent control.

603. **[Photographer unknown]**. **1933**. Sheep camp at Bally Spring. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 3 S., R. 34 E., sec. 20. **Size**: 5" x 4".
Notes: An original copy, mounted on form R6-E13.
Abstract: This is a black-and-white photograph of moderate quality; the image is in sharp focus throughout the middleground and background portions but the immediate foreground is not in focus. The following information is provided on the paper form (R6-E13, a camera point form) to which the print is attached: "CPS#22. Sheep camp at Bally Spring. Date: June 1933. Location: Bally Spring. Photo No. 1. Light: poor. Description of scene: photograph of sheep camp at Bally Spring on Ensign Allotment taken in June 1933. No number. Person who took picture unknown." The foreground area shows trampled forbs and grasses. The middleground is a flat meadow area with an individual standing off to one side of the developed camp area. The background shows the camp area, consisting of a cabin, table, pole nailed to a tree, and so forth. The background is very dark so it is difficult to distinguish everything in the background portion of this print. A dense mixed-conifer forest is also present in the background, behind the developed camp area.
Keywords: Historical photograph/Wallowa-Whitman NF/Mountain meadows/Ensign Creek/Sheep grazing/Grazing damage/Bally Spring.

604. **[Photographer unknown]**. **[Date unknown]**. Skookum Camp on main divide and road west of Mottet Meadow. Photo Number 247991. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [T. 4 or 5 N., R. 39 E.]. **Size**: 4" x 6½". **Notes**: An original copy.
Abstract: This is a black-and-white print of high quality; the image is in sharp focus throughout. Not much information is associated with this photograph. It shows an early Forest Service pickup (looks like a converted car from the 1930s) with a Forest Service Ranger standing in the road next to it. The road is a native-surface track with obvious ruts from low or moderate use. The foreground shows the roadway itself and a small accumulation of slash off the right hand side of the road. Most of the middleground scene is dominated by a dense, fairly young conifer forest, although the stand above the road (left hand side of the photograph) apparently has older, large-diameter trees. The background view shows gently undulating areas that appear to be high-elevation subalpine meadows that are either devoid of trees altogether, or has subalpine fir trees occurring in clumps or as stringers or ribbons across the landscape. Of the open areas that can be seen, it looks like there is little or no plant cover (perhaps from intense sheep grazing?) although obvious signs of soil erosion (gullies, etc.) are not in evidence either.
Keywords: Historical photograph/Umatilla NF/Sheep grazing/Subalpine grasslands/Walla Walla RD.

605. **[Photographer unknown]**. **[Date unknown]**. Subalpine meadow dominated by false hellebore. Photo Number

247988. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 4½" x 6½". **Notes**: An original copy.
Abstract: This is a black-and-white photograph of high quality; the image is in sharp focus throughout. This photograph does not include any information as to the photographer, when and where it was taken, or the subject. The photograph shows a meadow with a log cabin in the background. It appears from the number that this photograph may have been taken by F. W. Cleator. Many of the photographs taken by Cleator have similiar numbering. If this is the case, then this photograph was probably acquired about 1930 during the summer months, and probably depicts an area on the Walla Walla Ranger District. Most of the foreground and middleground views are dominated by a moist, subalpine meadow. It appears that heavy grazing (perhaps by sheep) has occurred in the past, as evidenced by a dense stand of false hellebore – a tall, poisonous forb that increases rapidly with overgrazing. There is a typical mature subalpine forest in the middleground and background portions of the photograph, with domination by lodgepole pine, Engelmann spruce, subalpine fir and western larch. Several dead trees (snags) can be plainly seen along the forest/meadow ecotone.
Keywords: Historical photograph/Mountain meadows/Umatilla NF/Walla Walla RD/False hellebore/Subalpine zone.

606. **[Photographer unknown]**. **[Date unknown]**. Table Rock and lookout cabin from road to south. Photo Number 247999. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [T. 6 N., R. 39 E., sec. 2 or 3]. **Size**: 4" x 6½". **Notes**: An original copy.
Abstract: This is a black-and-white photograph of generally poor quality; the focus appears to be sharp, but contrast problems and blotchy areas are common throughout the image, possibly caused by deterioration of this particular print through time. The caption associated with this accession is "Table Rock and Lookout Cabin from road to south. Typical of summit saddles through which road threads its way." The foreground area shows what appear to be immature subalpine firs of pole size or larger. The middleground shows a relatively steep mountain slope with a variety of vegetative conditions – open meadow areas are interspersed with forest clumps or stringers. The background shows Table Rock itself, a flat-topped summit with subalpine meadows covering most of it, but interspersed forest stands are also present in sheltered slope positions.
Keywords: Historical photograph/Umatilla NF/Subalpine fir/Mountain meadows/Walla Walla RD/Table Rock.

607. **[Photographer unknown]**. **[1921?]**. The Wenaha River. Photo Number 162379. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Wenaha River. **Size**: 4¼" x 6½".
Notes: An original copy, mounted on brown card stock with corner tabs.
Abstract: This is a high-quality black and white photograph, although a small section of the immediate foreground is out of focus. On the back of the photograph are the following hand-written notations: "On the Wenaha River, Umatilla Forest. A future recreation ground for Walla Walla, Pendleton and the wheat region. Vast amount of room here but not developed." This photograph was included in a 1994 reprint of a 1914 report prepared by George A Bright describing the results of a reconnaissance examination of the Wenaha National Forest (see Bright and Powell 1994). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest. [Note: this may be the best known photograph from the Wenaha National Forest. A cropped version of it (without the lower, out-of-focus portion) was used on the cover of a popular book entitled "100 years of federal forestry" (Bergoffen, William W. 1976. Agriculture Information Bulletin No. 402. Washington, DC: U.S. Department of Agriculture, Forest Service. 199 p.). The caption used for the cover of that book was "A forester at work on the Umatilla National Forest, Oregon, in July 1921. Wenaha River was then far from a road, so this Ranger had to travel with horse and pack outfit.".
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Wenaha River/Horse packing.

608. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 1. Photo Number 24539 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Thompson Creek. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This

item is photograph number 1 in the series; it appeared on page 86 of Kellogg's folio. Its caption is: "In Section 25, T. 6 S., R. 29 E. Looking along the Forest boundary across Thompson Cr., showing the characteristic succession of rims along the southern boundary of the forest." This photograph was taken a few miles east of Potamus Point and it depicts the rimrock country of the southern Umatilla National Forest well. The lower third of the photograph drops away from the viewer toward a canyon that supports stands of ponderosa pine and mixed conifers; the middleground and background areas depict the slope on the far side of the canyon. The slope is typical for a basalt rimrock, with horizontal outcrops or reefs of basalt alternating with steep, soil-covered areas supporting scattered timber or bunchgrass communities. The background shows the flat top of a mesa or plateau beyond the steep canyon slope, with a dense forest cover on the flat area.
Keywords: Umatilla NF/Historical photograph/Ponderosa pine/North Fork John Day RD/Rimrock/Thompson Creek/Mixed-conifer forest.

609. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 2. Photo Number 24540 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Gilbert/Potamus Creeks. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 2 in the series; it appeared on page 86 of Kellogg's folio. Its caption is: "Taken from Sec. 21, T. 6 S., R. 29 E., showing typical succession of rimrocks at the junction of Gilbert and Potamus Creeks. In many cases the perpendicular rim rocks form a barrier against accessibility. Note steepness of slope and lack of agricultural land." This photograph was taken about a mile north of Potamus Point and it depicts the rimrock country of the southern Umatilla National Forest very well. The foreground area shows a moderately-dense grass stand with minor amounts of angular surface rock present. Shrub stems are also present; they appear to be a currant or gooseberry species *(Ribes)*. The close middleground of the photograph drops away from the viewer toward a deep canyon that supports stands of ponderosa pine and mixed conifers; the far middleground and background areas depict the slope on the far side of the canyon. The far slope is a conical landform with a basalt caprock and horizontal basalt outcrops or reefs alternating with steep, soil-covered areas supporting scattered timber or bunchgrass communities. The far background shows the flat top of a mesa or plateau that supports a dense forest cover.
Keywords: Umatilla NF/Historical photograph/Ponderosa pine/North Fork John Day RD/Rimrock/Mixed-conifer forest/Heppner RD/Potamus Creek/Gilbert Creek/Ribes.

610. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 3. Photo Number 23792 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Little Wall Creek. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 3 in the series; it appeared on page 86 of Kellogg's folio. Its caption is: "In T. 6 S., R. 28 E. Looking west up Little Wall Creek showing rimrock formation and watershed sparsely timbered with Western Yellow Pine." This photograph depicts some of the broken, rimrock country of the southern Umatilla National Forest. The lower third of the photo shows the lower half of a moderately-steep canyon slope supporting open stands of ponderosa pine and clumps of mid-height shrubs. The middleground depicts the upper half of the canyon slope, which is covered with grassland, small exposures of basalt rimrock, and small timber and scattered western juniper trees. The background shows gentle canyon slopes with a mixture of open timber/grassland and dense, forested stringers following the drainages.

Keywords: Umatilla NF/Historical photograph/Ponderosa pine/Rimrock/Heppner RD/Little Wall Creek.

611. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 4. Photo Number 23791 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Swale/Skookum Creeks. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 4 in the series; it appeared on page 86 of Kellogg's folio. Its caption is: "Showing Swail Creek on right and Skookum Creek on the left. The two buttes in the foreground with rimrock are unnamed. Tupper Butte is seen in the distance." This photograph depicts obvious vegetational differences due to aspect, with open stands of grass and shrub on drier slopes and moderate to dense forest stands on moister slope exposures. The foreground shows a gentle to moderately-steep slope supporting mid-height shrubs (perhaps bitterbrush?) and grassland with relatively high canopy cover and plant density. The middleground depicts a densely forested slope (left half) and a stringer of trees that is apparently running up Swale Creek (right half). A scabland or heavily grazed area is also apparent just above the Skookum Creek drainage in the middleground. The background shows two gentle buttes with small amounts of basalt rimrock exposed on their slopes.
Keywords: Umatilla NF/Historical photograph/Rimrock/Heppner RD/Mixed-conifer forest/Swale Creek/Skookum Creek/Tupper Butte/Bitterbrush.

612. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 5. Photo Number 23789 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 5 in the series; it appeared on page 87 of Kellogg's folio. Its caption is: "In T. 6 S., R. 28. Showing rocky bunch grass covered slopes too stony for cultivation." This photograph depicts some of the broken, rimrock country found on the Heppner Ranger District of the Umatilla National Forest. The lower half of the photo shows a gentle to moderately-steep canyon slope supporting grassland and widely-scattered clumps of low to mid-height shrubs (perhaps bitterbrush?). There is apparently one clump of a tall-stature shrub (mountain mahogany?) in the left middleground. The upper half of this photograph depicts the far canyon slope, which supports a narrow fringe of ponderosa pine near the top (at the breaks). There are several small exposures of basalt rimrock on that slope, along with grassland and small scattered timber. The middleground shows a forested stringer that is apparently following a drainage or canyon bottom from left to right in the photograph. There are three horses shown in the middleground, none of which has a saddle or tack (perhaps they are wild horses?).
Keywords: Umatilla NF/Historical photograph/Rimrock/Heppner RD/Bitterbrush/Mountain mahogany.

613. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 6. Photo Number 23793 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the

point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 6 in the series; it appeared on page 87 of Kellogg's folio. Its caption is: "A typical open rocky flat with grass growing up between the rocks. Beyond the fringe of timber on the left extends another open rocky flat." This photograph depicts a typical dry site with shallow soils (approaching a scabland environment) on the Heppner Ranger District of the Umatilla National Forest. The lower half of the photo shows a gentle or flat site with a moderate amount of surface rock visible and an open stand of grass. The middleground includes a riderless horse with tack and a saddle. The background shows an open forest stand with short, rounded, bushy ponderosa pine trees.
Keywords: Umatilla NF/Historical photograph/Heppner RD/Ponderosa pine/Scabland/Grassland.

614. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 7. Photo Number 24538 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Matlock Creek. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 7 in the series; it appeared on page 87 of Kellogg's folio. Its caption is: "In Sec. 13, T. 5 S., R. 29 E., near the headwaters of Matlock Cr. Uprooted Western Yellow Pine showing shallow soil in meadow by the horizontal root system of the tree, and the depth and rocky nature of the subsoil from the upturn." This photograph is a close-up of a wind-thrown ponderosa pine tree. It shows the lower bole and the root wad of the tree. Two horses, both with tack and one with a saddle and the other with a pack, are standing next to the tree. The background is not in sharp focus but appears to show a moderate to dense stand of ponderosa pine and occasional Douglas-firs or grand firs.
Keywords: Umatilla NF/Historical photograph/Heppner RD/Ponderosa pine/Grand fir/Rocky Mountain Douglas-fir.

615. **[Photographer unknown]**. **1916**. Western Division, Umatilla extensive classification, No. 8. Photo Number 24542 A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8" x 10"; original was 5" x 7". **Notes**: A photographic copy of an original.
Abstract: This photograph was included with a land classification mapping project completed in 1916 (see F. B. Kellogg, "Land classification of the Umatilla National Forest, Oregon" for more information). Kellogg's land classification folio included six 18" x 21" sheets with high-quality black-and-white photographs of the Umatilla NF. Those sheets, numbered 82 through 87 in the upper right-hand corner, contained a total of 21 photographs. Each photograph was also accompanied by a short caption, many of which provided a legal description but only to the point of township and range. Since Forest Service negative numbers were shown in the lower right-hand corner of each photograph, we attempted to obtain copies of them from the Still Picture section of the National Archives. Unfortunately, negatives were only available for 2 of the 21 photographs. Therefore, a vendor was used to photograph the remaining 19 photographs and then provide us with 4" x 5" negatives and 8" x 10" prints for each image. This item is photograph number 8 in the series; it appeared on page 87 of Kellogg's folio. Its caption is: "In T. 6 S., R. 29 E. Typical scabby land, too stony for cultivation." This photograph depicts a typical dry site with shallow soils (approaching a scabland environment) on the Heppner Ranger District of the Umatilla National Forest. The lower half of the photo shows a gentle or flat site with a large amount of surface rock visible and a few scattered low-growing shrubs (perhaps sagebrush?). The background includes a riderless horse and a horse and rider (the rider has light-colored chaps and appeared in several of the photographs in this series). The background also shows two short, rounded, bushy ponderosa pine trees.
Keywords: Umatilla NF/Historical photograph/Heppner RD/Ponderosa pine/Scabland/Sagebrush.

616. **[Photographer unknown]**. **[Date unknown]**. Where Butte Creek comes into the Wenaha River. Photo Number 16238. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Butte Creek. **Size**: 4¼"

x 6½". **Notes**: An original copy, mounted to thin brown card stock using corner tabs.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. The caption for this photograph is "Where Butte Creek comes into the Wenaha River – Umatilla Forest." Note that Butte Creek and the Wenaha River merge in the southern part of the Wenaha-Tucannon Wilderness. This photograph also appeared in a 1994 reprint of George A. Bright's 1914 report describing an extensive reconnaissance of the Wenaha National Forest (see Bright 1914, and Bright and Powell 1994, in the history archives). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Butte Creek/Wenaha River.

617. **Pickford, G. D.; Reid, Elbert H. 1942**. Basis for judging subalpine grassland ranges of Oregon and Washington. Circular No. 655. Washington, DC: U.S. Department of Agriculture. 37 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This important circular describes the results of studies conducted in the Tenderfoot Basin and Lick Creek areas of the Wallowa Mountains in northeastern Oregon. Two grassland types were involved in the studies: the green fescue type, and the needlegrass-weed type. The following topics are included: range condition, utilization standards, and plant succession; plant succession stages in the green fescue type; relation of soil condition to stage of plant succession; influence of plant-succession stage on watershed and grazing values; range condition as interpreted from plant succession stage; current proper range utilization; and a summary of standards for judging subalpine rangelands. [Note that there are several other accessions in the history archives by these same authors; see Pickford and Reid (1948 and 1948), Reid (1942), and Reid and Pickford (1946) for more information.]
Keywords: Range management/Subalpine grasslands/Green fescue/Plant succession/Grazing damage/Historical document/Wallowa Mountains/Northeastern Oregon/Blue Mountains/Tenderfoot Basin/Forage utilization standards.

618. **Pickford, G. D.; Reid, Elbert H. 1948**. Forage utilization on summer cattle ranges in eastern Oregon. Circular No. 796. Washington, DC: U.S. Department of Agriculture. 27 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular presents the results of a 2-year study on the Starkey Experimental Range, Whitman National Forest, to determine forage utililization by cattle on pine-bunchgrass and pinegrass-elk sedge ranges in the Blue Mountains. The following topics are discussed: forage and utilization of untimbered range; signs of proper utilization; nutritive-plant values; forage and utilization of pine-bunchgrass range; forage and utilization of pinegrass- elk sedge range; seasonal values of major range types; relative values of major range types are guides to efficient use; and how to recognize good and poor condition of untimbered range. [Note that there are several other accessions in the history archives by these same authors; see Pickford and Reid (1942 and 1948), Reid (1942), and Reid and Pickford (1946) for more information.]
Keywords: Range management/Cattle grazing/Wallowa-Whitman NF/Starkey Experimental Range/Blue Mountains/Northeastern Oregon/Pine-bunchgrass rangelands/Pinegrass-elk sedge rangelands/Forage utilization standards/Historical document.

619. **Pickford, G. D.; Reid, Elbert H. 1942**. Guides to determine range condition and proper use of mountain meadows in eastern Oregon. Range Research Report No. 3. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 22 p. **Notes**: A photocopy of an original.
Abstract: Mountain meadows in eastern Oregon are generally small and infrequent. For that reason, their forage production was often considered an unimportant contribution to the total summer crop of range forage. The purpose of this document was to stress the importance of mountain meadows to summer range forage production in eastern Oregon and to provide general guidelines by which to judge the condition and the proper use of mountain meadow vegetation. It includes the following sections: introduction; earmarks of meadow condition (excellent condition, good condition, fair condition, poor condition); indications of trend in meadow conditions (downward trends, upward trends); recognizing proper use of meadows (proper utilization, proper management); list of common and botanical names of species mentioned with page references to the Range Plant Handbook; and guides to determine range condition, trend of condition, and proper use of meadow vegetation. The authors noted that many of the mountain meadows in eastern Oregon were in a more or less depleted condition, and that improper use of meadows for a period of years tended to decrease the total amount of vegetation and to change the composition from principally grasses and sedges to a predominance of weeds. The information and recommendations in this document were based on studies completed in 1940 and 1941 on the Whitman National Forest, and a survey of 31 meadows throughout the Blue, Cascade, and Warner Mountains of eastern Oregon during 1941. This document contains numerous figures and tables that summarize important information referenced by the text. The last page was designed

for field use and is entitled "Guides to determine range condition, trend of condition, and proper use of meadow vegetation." [Note that there are several other accessions in the history archives by these same authors; see Pickford and Reid (1942 and 1948), Reid (1942), and Reid and Pickford (1946) for more information.]
Keywords: Range management/Mountain meadows/Eastern Oregon/Historical document/Whitman NF/Blue Mountains.

620. **Pinchot, Gifford**. **1937**. Letter to Mr. C. J. Buck. Unpublished Typescript Correspondence. Milford, Pike County, PA: [Publisher unknown]. 1 p. **Notes**: A transcribed copy.
Abstract: This accession consists of a short, one-page letter from Gifford Pinchot, first Chief of the United States Forest Service (he was not Chief when the letter was written) to Mr. C. J. Buck, Regional Forester of the Pacific Northwest Region of the Forest Service. It was written after Pinchot returned home to Pennsylvania after "one of the most delightful trips I ever had in my life" to visit the Pacific Northwest and view forest management practices on the national forests there. An interesting paragraph in the letter is "one of the things which struck me most was your wisdom in preferring the high forest selection system as against clear cutting. What I saw in that line convinced me completely that what you are doing is not only the right thing for the forest but also very much the right thing in its effect on public sentiment."
Keywords: Clearcutting/Forest management/Historical document/Selection cutting/Gifford Pinchot.

621. **Pinchot, Gifford**. **1903**. A primer of forestry. Part I.– The forest. Bulletin No. 24. Washington, DC: U.S. Department of Agriculture, Division of Forestry. 88 p. **Size**: 5" x 7". **Notes**: An original copy.
Abstract: This early classic by an important pioneer of American foresty, and first Chief of the U.S. Forest Service, includes the following chapters: the life of a tree; trees in the forest; the life of a forest; and enemies of the forest. This book contains numerous illustrations, including 47 photographic plates and 83 figures.
Keywords: Historical document/Forest policy/Forest history.

622. **Pinchot, Gifford**. **1905**. A primer of forestry. Part II.– Practical forestry. Bulletin No. 24, Part II. Washington, DC: U.S. Department of Agriculture, Bureau of Forestry. 88 p. **Size**: 5" x 7". **Notes**: An original copy.
Abstract: This early classic by an important pioneer of American foresty, and the first Chief of the U.S. Forest Service, includes the following chapters: the practice of forestry; work in the woods; the weather and the streams; and forestry abroad and at home. This book contains many illustrations, including 18 photographic plates and 47 figures.
Keywords: Historical document/Forest policy/Forest history.

623. **Pinchot, Gifford**. **1899**. The relation of forests and forest fires. National Geographic. 10: 393-403.
Notes: A photocopy of an original.
Abstract: This early article by the first chief of the U.S. Forest Service describes some relationships between forest fires and the species composition of the forest. Illustrated with high-quality photographs, the article provides numerous examples of fire's ecological role, ranging from ponderosa pine forests in the Black Hills of South Dakota to the lodgepole pine type of the Rocky Mountains and the longleaf pine forests of the southeastern United States.
Keywords: Fire ecology/Fire history/Fire effects/Historical document.

624. **Pinkett, Harold T. 1970**. Forest Service records as research material. Forest History. 13 (1 (January)): 18-29.
Notes: A photocopy of an original.
Abstract: This article provides an overview of records related to Forest Service research that are stored at the National Archives. It provides a detailed discussion of the type of records present, and also provides some facsimile examples of different types of material. Records pertaining to the following topics are discussed: executive direction and program planning; national forest administration; cooperation with non-federal owners; forest research; and scientific and technical.
Keywords: U.S. Forest Service history/Forest history/National Archives.

625. **Pinkett, Harold T. 1949**. Preliminary inventory of the records of the Forest Service. Preliminary Inventory No. 18; National Archives Publication No. 49-22. Washington, DC: The National Archives, National Archives and Records Service, General Services Administration. 17 p. **Notes**: A photocopy of an original.
Abstract: This document is a preliminary inventory of the textual materials in record group 95, Records of the Forest Service, that had been transferred to the National Archives as of December 31, 1948. The total volume of those records amounts to 1,426 cubic feet. Cartographic records of the Forest Service are described in preliminary inventory number 167, Cartographic Records of the Forest Service (see Ashby 1967). Measurements of records in this inventory are approximations in linear feet. Most of the records are letter size (8" x 10.5").

Keywords: Forest history/Historical document/National Archives.

626. **Pinkett, Harold T. 1947**. Records of research units of the United States Forest Service in the National Archives. Journal of Forestry. 45 (4 (April)): 272-275. **Notes**: A photocopy of an original.
Abstract: This article provides an overview of records related to Forest Service research that are stored at the National Archives. In particular, it discusses establishment of the Research Compilation File, which contains records pertaining to research conducted between 1897 and 1936. Copies of correspondence, reports, and memoranda were routed to that collection when deemed important for research or reference. Records in the Research Compilation File occupy 250 lineal feet of shelf space in the Archives. Materials in the Compilation File are organized by the following subjects: administration; auxiliary subjects; description and resources; economics; education; forestation; forest organization; history; investigation; legislation and policy; management; mensuration; protection; publications; silvical requirements; types; tree studies; utilization; and valuation. Comments about the Project File of the Forest Products Laboratory, the Copeland Report (1932-33), and the Forest Taxation Inquiry Records are also provided in this article.
Keywords: Forest history/Historical document/National Archives/Research Compilation File.

627. **Piper, A. M. 1928**. Piedmont plain at north flank of Blue Mountains. Photo Number 122. Unknown. **Locality**: Northern Blue Mountains. **Size**: 8” x 10”.
Notes: A high-quality print from the photographic library of the U. S. Geological Survey in Denver, Colorado.
Abstract: Photographer was assigned to the U. S. Geological Survey. This picture is a black and white photograph showing the plains (valley) area near the foothills of the northern Blue Mountains. The print quality is good; both the foreground and background portions are in sharp focus. The vegetation in the foreground is mostly grass and rabbitbrush. The middleground changes to grass, shrubs, and hardwood trees along the riparian area. The hardwoods are most likely cottonwood, while the shrubs are probably willow. Cattle are grazing in a low-lying field adjacent to the riparian zone. In the distant background, the foothills of the northern Blues are shown. What is particularly interesting about the background scene is that apparently the forests (ponderosa pine?) came all the way down to the valley floor, at least on the cooler, north- or east-facing aspects. That is a much lower elevational distribution for the forests than the current situation, where agriculture is the dominant land use on those sites.
Keywords: Historical photograph/Blue Mountains/Ponderosa pine/Willows/Cattle grazing/Black cottonwood.

628. **Piper, Charles V.; Beattie, R. Kent**. **1914**. Flora of southeastern Washington and adjacent Idaho. Lancaster, PA: Press of the New Era Printing Company. 296 p. **Size**: 6” x 9”. **Notes**: An original copy (rebound).
Abstract: This book consists of regional flora covering the plants of Spokane, Whitman, Asotin, Garfield, Columbia, and part of Walla Walla counties, Washington, and the western portions of Kootenai, Latah, and Nez Perce counties, Idaho. It describes 20 pteridophytes, 11 gymnosperms, 270 monocotyledons, and 838 dicotyledons. Keys are provided for the species.
Keywords: Historical document/Plant identification/Blue Mountains/Southeastern Washington/Idaho.

629. **Plummer, Fred G. 1912**. Forest fires: their causes, extent and effects, with a summary of recorded destruction and loss. Bulletin 117. Washington, DC: U.S. Department of Agriculture, Forest Service. 39 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin provides a summary of forest fires for time periods for which records are available. Fire occurrence, by cause, is summarized for the national forests for the period of 1906 through 1911, and for periods before then for property fires. “Ancient” fires are described by interpretation of fire scars on Sequoia trees. Drought periods for the period between 1662 and 1910 are discussed, primarily as a contributary cause of forest fires. The smoke phenomena of forest fires are discussed, as are historic fires of great significance such as Miramichi, Peshtigo, Coos, etc. Some statistics of damage and loss from forest fires are presented.
Keywords: Forest fires/Historical document.

630. **Plummer, Fred G. 1912**. Lightning in relation to forest fires. Bulletin 111. Washington, DC: U.S. Department of Agriculture, Forest Service. 39 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin describes the results of studies about lightning and its effect on forest fires, including the following topics: nature and kinds of lightning; effects of lightning on trees and soil; supposed susceptibility of trees to lightning; and investigations into lightning in the United States, including the geographic distribution of lightning, a record of trees struck and set on fire by lightning, and the electrical conductivity of native tree species.
Keywords: Lightning/Forest fires/Historical document.

631. **Porter, Oliver M. 1915?** The fire problem on the Malheur National Forest. Annual Technical Report. [Place of

publication unknown]: U.S. Department of Agriculture, Forest Service. 55 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The Malheur NF, located in the heart of the Blue Mountains of northeastern Oregon, comprised a gross area of 1,262,840 acres when this report was written. It contained an open but valuable timber stand that was estimated at six and one-half billion board feet of western yellow pine, Douglas-fir, western larch, and several minor species. The timber was conservatively estimated to be worth thirteen million dollars. Due to its openness, nearly every acre of the Forest provided forage for domestic livestock – 24,300 cattle and horses, and 135,500 sheep, grazed on it each year. Settlers and ranchers of the John Day and Harney valleys depended on the timber and forage resources of the Forest for their livelihoods. As a result of its value for timber production and livestock grazing, fire protection was important on the Malheur NF. This report describes the methods and policies pertaining to fire protection on the Forest. It includes the following sections: introduction; hazard; fire season; character of fires (types, causes, speed of burning); cooperation (advantages, results, suggested system of cooperation); methods of prevention (enforcement of fire laws, signs); method of detection (present system, suggested system); methods of suppression (tools, trenching and fire lines, back firing); and conclusion. In the five years previous to the preparation of this report, an average of 16.4 fires had occurred per year on the Forest. The author noted that the incidence of fires had been slowly increasing since establishment of the national forests, but was unsure of the reasons for the increase. There were three main types of fire on the Malheur: timber fires, brush fires, and sagebrush fires. Primary causes of fires for the previous five-year period included: lightning (33%), brush burning (1%), campers (28%), saw mills (1%), miscellaneous (10%), and unknown (27%). The unknown category included carelessness in the use of matches and tobacco, and any malicious fires. A two-page table summarizes information from all of the annual fires reports for the period of 1911 to 1915, inclusive. In the section discussing prevention, the author poses several ideas for handbills and other materials that could be provided to school children so that they could bring them home to their parents. At the time this report was written, the Forest had one operating fire lookout on Strawberry Mountain. The author was not in favor of the lookout system because so few existed on the Forest; he believed that systematic patrols during the fire season was a more effective detection method.
Keywords: Blue Mountains/Fire control/Fire danger/Fire detection/Fire fighting/Fire lookouts/Fire prevention/Fire weather/Forest fires/Forest flammability/Historical document/Malheur NF/Smoker-caused fires.

632. **Potter, A. F. 1905**. Practical results of the regulation of grazing on the forest reserves. Proceedings of the American Forest Congress. Washington, DC: H. M. Suter Publishing Company: 210-217.
Notes: A photocopy of an original.
Abstract: As the forest reserves were established, one of the first matters of importance was assignment of grazing privileges. This article describes how grazing allotments were established and administered immediately after creation of forest reserves. Although stockmen initially opposed the reserves, they eventually supported them after better understanding government policy.
Keywords: Grazing/Historical document/Forest reserves/Range history.

633. **Potter, A. F. 1911**. Press notice regarding the importance of the livestock industry to the general welfare of the West. Unpublished Typescript Press Notice. Washington, DC: U.S. Department of Agriculture, Office of the Secretary. 2 p. **Size**: 8½" x 14". **Notes:** A photocopy of an original.
Abstract: This short accession consists of a 2-page press notice (release) recounting the remarks of Associate Forester (Chief) Potter to the annual convention of the National Woolgrowers Association at Omaha, Nebraska. It is dated December 12, 1911, although it is unknown if that was the date of Potter's actual address. Mr. Potter begins by summarizing the history of sheep grazing in the western United States, pointing out that the mountain ranges eventually included in the national forests had been occupied by flocks of sheep long before the Forests had been created. He then describes the great amount of damage caused by overgrazing occurring before their inclusion in the national forest system, and the measures being used by the Forest Service to check the damage with the least curtailment of existing grazing privileges. After allocating the Forests into areas that were viewed as being most suitable for either sheep or cattle, a program was initiated to develop water sources and to open trails to improve livestock access into unutilized areas. Potter mentioned that 1,442,000 cattle and horses, and 7,450,000 sheep and goats were grazed on the national forests during the previous year (1911?). He then mentioned that few conflicts were occurring between grazing and forest management, primarily because cut-overs being replanted constituted less than one percent of the Forests each year. He also describes the results of artificial reseeding experiments that involved a wide variety of non-native (exotic) species such as redtop, Hungarian brome grass, timothy, Italian rye, Kentucky bluegrass, alsike and white clovers, orchard grass, tall meadow oat grass, Canadian bluegrass, and hard or sheep fescue.
Keywords: Historical document/Range management/Cattle grazing/Grazing damage/Range seeding/Sheep grazing/Exotic species.

634. **Poulton, Charles Edgar**. **1955**. Ecology of the non-forested vegetation in Umatilla and Morrow Counties, Oregon. Pullman, WA: State College of Washington. 166 p. Doctoral Dissertation.
Availability: University Microfilms, Ann Arbor, MI. **Notes**: A relatively poor copy derived from microfilm.
Abstract: This document describes a synecological study of the northern three-fourths of Umatilla and Morrow Counties in Oregon. It was designed to provide an improved ecological basis for management of rangelands and agricultural lands in the study area. Fifty-four relict stands were located, and 18 were selected for intensive study of their vegetation and soils. Based on an analysis of those stands, the area was divided into three physiographic zones using vegetation, soils, and climate (temperature and precipitation). The zones are *Artemisia-Agropyron*, *Agropyron-Poa*, and *Festuca-Koeleria*. Plant associations were described for each zone. The use of *Artemisia tridentata* as an indicator of site potential was investigated in several respects. Grass density was found to inhibit establishment of *Artemisia*, but not its growth after establishment. Both radial and height growth of *Artemisia* were found to be correlated with stand density; if corrected for density, radial growth of *Artemisia* was found to have the greatest promise as an index of site quality. Establishment of *Artemisia* seedlings seemed to coincide with occasional years in which spring precipitation was well above average. *Artemisia* longevity averaged sixty to sixty-five years, with occasional plants surviving ninety-one years or more.
Keywords: Umatilla County OR/Historical document/Morrow County OR/Northeastern Oregon/Plant associations/Plant ecology/Range management/Vegetation classification/Artemisia tridentata/Sagebrush.

635. **Powell, J. W. 1890**. The non-irrigable lands of the arid region. The Century Magazine. 39 (126): 915-922.
Notes: A photocopy of the original article published in April, 1890.
Abstract: In this paper, Major John Wesley Powell explores some reasons for the distribution of forests in the arid regions of the western United States. He claims that "if there were no intervening agency, climate would cover the earth with trees wherever there is more than ten inches of rain." For the arid West, Powell contends that the agency which prevents that from occurring is fire. "Rainfall, then, furnishes the potential limit to forest growth, fire the actual limit." Rainfall also reigns in fire until a point is reached where "forty inches of yearly rain establishes a practical limit to its ravages. In a region where prairie and grove divide the land between them, fire and storm are evenly matched. Fire is king on the plains; storm rules where the forest stands." Powell goes on to describe other ecological relationships operating in the arid West, including a description of a large forest fire that he started himself. This paper is interesting not just because of Powell's descriptions of the Southwest and Rocky Mountain regions, but because of his lyrical and poetic writing style.
Keywords: Forest influences/Fire ecology/Southwestern United States/Climate/Historical document/Precipitation.

636. **Prater, Leland J. 1974**. Historical Forest Service photo collection. Journal of Forest History. 18 (April): 28-31.
Notes: A photocopy of an original.
Abstract: This article describes Forest Service photographs deposited in the National Archives. At the time it was written, nearly 500,000 photographic negatives were being evaluated to determine if they should be deposited in the Audiovisual Archives Division of the National Archives. The article provides an interesting history of photography in the Forest Service, going back to Gifford Pinchot's early photographic efforts and his emphasis on photography in the Forest Service because of its value for education and monitoring. The first Forest Service Manual on photography was prepared by George Sudworth in 1906. This article also discusses Forest Service photography after World War II and into the 1970s, including efforts to catalog the photographs at Fort Collins, Colorado.
Keywords: Photography/U.S. Forest Service history/Forest history/National Archives/Gifford Pinchot.

637. **Preston, J. F. [Date unknown]**. Natural forest types, Montana and Idaho. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 5 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: A forest type was defined as an association or mixture of species reasonably constant under the same conditions; if the conditions were permanent as indicated by the fact that the type succeeds itself under nature's treatment, it was a permanent type. If any of the conditions responsible for the type's existence were temporary, as indicated by the fact that in the course of natural reproduction the dominant species or the mixture would be changed, then it was a temporary type. Types were determined by the physical conditions of an area and by the struggle for existence between the different species (competition). A classification of forest types really amounts to a classification of the physical factors which largely determined the species composition of an area. Classification involved dividing an area into permanent and temporary forest types, and then determining what the permanent type would be for all areas occupied by temporary types. The author recommended that unquestionably virgin stands be identified, and then analyze their physical factors in order to compare them with others occupying similar situations. When using physical factors to aid with classification, it is necessary to decide how much of a change in any particular factor will be considered. The author recommended that reproduction be used to make those deci-

sions since changes in the amount and composition of natural reproduction would be most sensitive to changes in physical factors. The primary factors to be used for delineating forest types were: tolerance or light requirements of the various species; moisture and temperature requirements of the species; and reproductive power. While tolerance was recognized to be a biological, rather than physical, factor, it was still considered to be the most important of the three. The reproductive power of the species was largely a function of growing conditions, soil moisture, length of the growing season, and the warmth of the soil and air during the growing season. The main factors to be considered in the field when classifying forest types were physical factors: soil moisture, depth and quality of soil, warmth of soil and air during the growing season, and the general climatic environment and elevation of the locality. Seven natural forest types were recognized for Montana and Idaho: juniper, yellow pine, cedar-hemlock, Douglas-fir, lodgepole pine, spruce, and alpine (alpine fir). Preston also provides a list of physical factors that were associated with each of the seven natural forest types.
Keywords: Forest inventory/Forest mapping/Historical document/Land classification/Forest types/Montana/Northern Idaho.

638. **Public Lands Commission**. **1905**. Grazing on the public lands. Bulletin No. 62. Washington, DC: U.S. Department of Agriculture, Forest Service. 67 p. **Size**: 6" x 9". **Notes**: A photocopy of an original.
Abstract: This document contains extracts from the Report of the Public Lands Commission, the whole of which was published as Senate Document No. 189, Fifty-Eighth Congress, Third Session. Major topics discussed are: questions regarding the public grazing lands of the western United States; map of the grazing lands (map was not included with this copy); a plan for control and improvement of grazing lands; a report on grazing leasing systems, with examples; and a system for the regulation of grazing on the public lands of the United States.
Keywords: Historical document/Cattle grazing/Grazing/Livestock forage/Range history/Range management/Western United States.

639. **Puter, S. A. D.; Stevens, Horace**. **1908**. Looters of the public domain. Portland, OR: The Portland Printing House. 468+ p. **Notes**: A photocopy of an original.
Abstract: The author of this book is referred to as the "king of the Oregon land fraud ring." The book's subtitle is: "embracing a complete exposure of the fraudulent system of acquiring titles to the public lands of the United States." The book is dedicated to the memory of Davy Crockett, who said "first be sure you're right, then go ahead." This book describes extensive and lucrative land frauds that occurred in Oregon in the early 1900s, many of which involved officials of the General Land Office. The scandals also involved members of Oregon's congressional delegation, including Senator Mitchell and Congressman Williamson. Just certain portions of this book were copied, since all of it did not pertain to eastern Oregon. Chapter 12 describes the Blue Mountain Forest Reserve conspiracy, and other chapters of related interest are also included.
Keywords: Blue Mountains Forest Reserve/Forest history/Historical document/Timber fraud.

640. **Raber, Oran**. **1937**. Water utilization by trees, with special reference to the economic forest species of the north temperate zone. Miscellaneous Publication No. 257. Washington, DC: U.S. Department of Agriculture. 97 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This document describes the water use relationships of trees, with data and summaries provided for major tree species of North America (both eastern and western species are included). The following topics are discussed: absorption of water by trees (shoots and roots); storage of water in trees and water content of tissues; water losses of trees (transpiration, etc.); adaptations of trees to dry conditions; and water consumption by trees, including estimates of their water requirements.
Keywords: Forest influences/Tree physiology/Water yield/Transpiration/Water use efficiency/Historical document.

641. **Rachford, C. E. 1928**. Game administration on the national forests. Unpublished Typescript Report. Washington, DC: U.S. Department of Agriculture, Forest Service. 9 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is the text of a speech delivered at the Fifteenth National Game Conference held at the Hotel Pennsylvania in New York City on December 3 and 4, 1928. The author was an Assistant Forester (Chief) in the Washington Office of the U.S. Forest Service. The report begins by stating that 75%, or 900,000, of the big-game animals of the public land states (the western United States?) occur in the national forests. The range of game management problems on the national forests was great – some portions were not adaptable to wildlife management, others had only a small remnant of once large herds of big game animals, some were on the road to a fairly well-stocked condition, while others had a lack of habitat or feed for the number of animals that were present. The author then posed three main questions with regard to big-game management on the national forests: how can we get more game on many areas; how can we get less game on some areas; and how can we maintain the right num-

ber of animals on any given area? Not surprisingly, this report contains three sections: getting more game on many areas; getting less game animals on some areas; and maintaining the right number of animals. The Forest Service policy on restocking depleted areas was to assure that the area in question was adapted to the particular species involved, that year-long range was available in the area, and that some provision was made for maintaining the herd at numbers dictated by the habitat conditions. An important aspect of game management is enforcement of state hunting laws. During 1927, forest officers referred to state officers 496 game law violations and prosecuted 109 cases themselves. In some areas such as the Grand Canyon Game Preserve, it was necessary to kill animals in order to reduce herd sizes to a level that could be sustained by their habitat and to reduce starvation-related mortality. The best way to maintain sustainable herd sizes was to determine proper carrying capacities based on habitat conditions, and then to use regulated hunting as a tool to keep populations within those capacities. For areas located outside of federal game preserves, State laws were applicable to national forest lands. Management of game populations would have been simpler if State game commissions had been able to establish hunting seasons and management unit boundaries unhampered by political considerations. There were five prerequisites for controlling game surpluses: 1) correct determination of the carrying capacity; 2) correct determination of the number of animals to remove to keep the habitat in good condition; 3) regulated hunting to provide sport and to regulate the herd sizes; 4) laws and regulations wisely administered and strictly enforced; and 5) a favorable public sentiment based on the knowledge that every game area is capable of sustaining a definite number of animals and no more.
Keywords: Historical document/Wildlife management/Big game.

642. **Rakestraw, Lawrence**. **1979**. A history of forest conservation in the Pacific Northwest, 1891–1913. New York, NY: Arno Press. 345 p. **Size**: 6” x 9”.
Notes: An original copy. Originally presented as the author’s Ph.D. thesis, University of Washington, in 1955.
Abstract: This book includes the following chapters: background of the forest conservation movement, 1860-91; reserves in the Northwest, 1891-97; forest administration, national and local, 1897-1905; grazing in the Cascade Range, 1897-99: Muir vs. Minto; reserves in Washington, boundary work, 1897-1907; reserves in Oregon, boundary work, 1897-1907; the national forests in District Six, 1905-1913; the triple alliance; and a bibliography.
Keywords: Forest history/Historical document/National forests/U.S. Forest Service history/Forest reserves/Pacific Northwest/Pacific Northwest Region.

643. **Ramaley, Francis**. **1907**. Plant zones in the Rocky Mountains of Colorado. Science. N.S. 26 (671): 642-643.
Notes: A photocopy of an original.
Abstract: This short article describes vegetation zones of the Rocky Mountains in Colorado. The author begins by describing a European classification by Schimper that included three zones: basal, montane, and alpine. However, Ramaley recognized that Schimper’s zones did not fit the Colorado Rockies, and proposed a classification involving five zones: a plains zone, situated at low elevations and adjacent to the mountain range itself; a foothills zone, consisting of open forests at low elevations on the mountain slopes; a montane zone, an intermediate band supporting several different forest types; a subalpine zone, the highest elevations dominated by forests (primarily Engelmann spruce and subalpine fir); and an alpine zone, a non-forest area located between upper treeline and the mountain summits.
Keywords: Alpine zone/Historical document/Plant ecology/Rocky Mountains/Vegetational zonation/Colorado/Plains zone/Foothills zone/Montane zone/Subalpine zone.

644. **Randall, Charles E.; Edgerton, D. Priscilla**. **1938**. Famous trees. Miscellaneous Publication No. 295. Washington, DC: U.S. Department of Agriculture. 116 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: This publication describes trees associated with notable persons, events, and places. Topics discussed are: trees associated with notable people, trees associated with the building of the nation, trees associated directly with educators or educational institutions, trees associated particularly with writers and literature, trees associated with religion, trees that have had special protection, trees with peculiar aesthetic or sentimental associations, heads of tree families, trees notable for unusual size or age, old or large trees in the United States and outstanding foreign rivals, and freak trees.
Keywords: Historical document/Unique trees/Big trees/Old trees.

645. **Randall, Charles E.; Heisley, Marie Foote**. **1950**. Our forests: what they are and what they mean to us. Miscellaneous Publication No. 162. Washington, DC: U.S. Department of Agriculture. 38 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper. This is a revision of the original publication issued in 1933; a copy of the original is also in the library.
Abstract: This publication describes forests of the United States, and provides some history of their management. The following topics are discussed: what the forest is; forest regions of the United States; how our forests serve us;

enemies of the forest; forestry in the United States; and timber – a vital national resource.
Keywords: Historical document/Forest history/Forest management/Tree physiology.

646. **Read, Arthur D. 1935**. The profession of forestry. New York, NY: The Macmillan Company. 68 p. **Size**: 6” x 8”.
Notes: An original copy. This book was originally published in April, 1934; this version is a reprint published in April, 1935.
Abstract: This short book includes the following chapters: the business of forestry; the employment of foresters; and the demand – remuneration – qualifications of foresters. An appendix (organizations, budgets, etc.) and an index are also included. Although the textual portion is relatively short, this book also includes copious black-and-white photographs of high quality.
Keywords: Forest administration/Forest organization/Forestry extension information/Historical document.

647. **Reid, Elbert H. 1942**. Important plants on national forest ranges of Eastern Oregon and Eastern Washington. Range Research Report No. 1. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 64 p. **Size**: 8” x 5”. **Notes**: An original copy.
Abstract: This booklet gives simple keys, descriptions, and notes on the occurrence and forage value of important plants on national forest rangelands of eastern Oregon and eastern Washington. It was designed to supplement the Range Plant Handbook (see Dayton and others 1937). Only species that are important for forage production, or abundant on rangelands regardless of their forage value, are included in this guide. [Note that there are several other accessions in the history archives by these same authors; see Pickford and Reid (1942, 1948, and 1948), and Reid and Pickford (1946) for more information.]
Keywords: Historical document/Plant identification/Livestock forage/Eastern Oregon/Eastern Washington.

648. **Reid, Elbert H.; Pickford, G. D. 1946**. Judging mountain meadow range condition in eastern Oregon and eastern Washington. Circular No. 748. Washington, DC: U.S. Department of Agriculture. 31 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This important circular covers the following topics: the importance and nature of mountain meadows; recognizing range condition of mountain meadows (good, fair, poor, and very poor); meadow condition determines grazing value; judging trends in meadow condition; indicators of a downward condition trend; indicators of an upward trend; proper management of mountain meadows; benefits from proper meadow management; and guides to determine range condition and trend of mountain meadow vegetation. [Note that there are several other accessions in the history archives by these same authors; see Pickford and Reid (1942, 1948, and 1948), and Reid (1942) for more information.]
Keywords: Range management/Mountain meadows/Eastern Oregon/Eastern Washington/Historical document.

649. **Reineke, L. H. 1933**. Perfecting a stand-density index for even-aged forests. Journal of Agricultural Research. 46 (7): 627-638. **Notes**: A photocopy of an original.
Abstract: This article was prepared by an associate silviculturist at the California Forest Experiment Station. Reineke discovered that any pure, fully stocked, even-aged stand of a given average stand diameter (the diameter at breast height of a tree with the average basal area) has approximately the same number of trees per acre as any other pure, fully stocked, even-aged stand of the same species and average stand diameter. This relationship was not significantly affected by age or site quality. Reineke then developed maximum density curves (not a fitted curve, but the maximum or outer density expected for a particular average stand diameter) for a variety of species. Since the curves for redwood and red fir had the highest densities of any species examined, their maximum density was used as a reference curve. A series of curves were then plotted that paralleled the reference curve, and they could be used to convert the number of trees per acre at any stand diameter to an equivalent density at an average stand diameter of 10 inches. Thus, Reineke’s stand density index (SDI) is the number of trees per acre at an average stand diameter (ASD) of 10 inches – 4000 trees per acre at an ASD of 2 inches is equivalent to 300 trees per acre at an ASD of 10 inches, and both stands have an SDI of 300.
Keywords: Forest measurements/Forest regulation/Historical document/Stand Density Index/Stand density.

650. **Rhoads, Arthur S. 1923**. The formation and pathological anatomy of frost rings in conifers injured by late frosts. Bulletin No. 1131. Washington, DC: U.S. Department of Agriculture. 15 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This short bulletin describes a study of frost rings in conifers of northern Idaho, northeastern Washington, and northwestern Montana. Pertinent literature about frost rings is reviewed. The general symptoms, macroscopic appearance, and anatomical structure of frost rings are described.
Keywords: Frost rings/Idaho/Montana/Washington/Timber defects/Historical document.

651. **Rich, E. E.; Johnson, A. M. 1950**. Peter Skene Ogden's Snake Country journals; 1824-25 and 1825-26. London, U.K.: The Hudson's Bay Record Society. 9 p. **Notes**: A photocopy of an original.
Abstract: This accession consists of selected pages copied from a larger work. Ogden's journals gradually became important as an early source about the history of the American West. This accession consists of selected pages copied from a larger work. It provides journal material from an early fur trapper who was persistent and resourceful in his pursuit of beaver. Ogden worked for the Hudson Bay Company, who controlled much of the beaver trade in western North America. He was characterized as a shrewd observer of human nature, based on his comments about his party members, the American Indians he met, and upon himself. Pages 114-123 describe Ogden's travels as he headed east through Grant County, Oregon, along the main stem of the John Day River to Dixie Pass and then into the Burnt River drainage. This section covers journal notes from Saturday, January 14th, 1826 (at the South Fork of the John Day River) to Friday, February 3rd, 1826 when Ogden was in the Burnt River drainage. Pages 194-197 describe his return on the westward trip, when he followed the same route he used on the 1/14/1826-2/1/1826 expedition (the eastward travels). That section covers journal entries from Monday, June 26th, 1826 to Thursday, July 4th, 1826 when he was back in Grant County and just beyond Dayville, Oregon. The journal entries in this material recount climatic conditions, beaver trapping activities, big-game accounts, and interactions with American Indians.
Keywords: Eastern Oregon/Historical document/Explorer journals/Peter Ogden/Fur trapping/Hudson Bay Company.

652. **Richards, W. A. 1905**. Work of the General Land Office in the administration of the reserves. Proceedings of the American Forest Congress. Washington, DC: H. M. Suter Publishing Company: 381-390.
Notes: A photocopy of an original.
Abstract: This article is the text of an address given by the Commissioner of the General Land Office (GLO) on its role in the administration of the forest reserves. After their creation, the GLO was responsible for administration of the forest reserves. The balance of the article describes some of the history of the forest reserves, and how the GLO came to acquire responsibility for their administration. The organization, policies, and regulations governing the reserves themselves, and their administration by GLO, are described in some detail.
Keywords: Forest reserves/Historical document/General Land Office.

653. **Rockwell, F. I. 1912**. Methods of classifying forest types with special reference to reconnaissance and working plans. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 12 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The separation of a forest area into forest types is usually done with one of two objectives in mind: 1) to get a general understanding of the silvical conditions found on the Forest and of the principles that give rise to those conditions, so as to better plan silvicultural operations such as marking and cutting, brush disposal, planting, etc.; or 2) to know the nature of the existing forest cover in order to compute present and future timber yields, distribute cutting operations, and to calculate the annual harvest level for the balance of the rotation. For the first objective, delineation of "permanent cover types" was required, which based delineation on physical or ecological conditions of an area, not on species composition, age, or anything else that might be considered temporary or variable. For the second objective, it was believed that the proper classification method should use the species composition of the existing stand, or of the stand that would next come to market. The second method, which had typically been used in reconnaissance efforts up to that point, had worked fairly well for the Forests of the Rocky Mountains because the permanent type coincided closely with the existing composition. For Forests west of the Continental Divide, the second method was not satisfactory because the predominant species in existing stands did not always coincide with the expected composition for the permanent type. If mapping and classification were driven by the existing composition, a plethora of forest types would be the result. There were many logistical problems associated with that approach, since numerous types were difficult to keep track of, develop yield tables for, or portray on a management-related map. On the other hand, use of natural or permanent types was viewed as a way to simplify the work. Although they may have been a little more difficult to determine in the field because of the need to use physical factors, there were ordinarily not more than three or four permanent types for any particular area and it was possible to identify them readily after a little training and experience. The author identified seven permanent types for northern Idaho and Montana: western yellow pine, pure Douglas-fir type, larch-Douglas-fir type, lodgepole pine type, cedar-hemlock type, Engelmann spruce type, and alpine type. The report then provides instructions for preparing age-class maps (including colors to be used for each class), for designation of predominant species and volume class for each mapped stand, and for preparing the type maps themselves (including colors for each type). Instructions about how to handle site quality are also provided, assuming that the mapper wanted to include it on the final map. The final page of this report provides a list of tree species found in District I and their associated symbols for use on forest type maps.
Keywords: Forest inventory/Forest mapping/Historical document/Land classification/Forest types/Montana/North-

ern Idaho.

654. **Roe, Arthur L. 1952**. Growth of selectively cut ponderosa pine stands in the upper Columbia Basin. Agriculture Handbook No. 39. Washington, DC: U. S. Department of Agriculture, Forest Service. 29 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This handbook reports the results of a study completed during the 1947 field season using 60 half-acre, temporary plots on 21 cut-over areas located throughout western Montana. The sampled stands ranged from approximately 500 to 10,000 board feet per acre. The study was initiated to obtain information from partial-cut ponderosa pine stands, a practice that was being used extensively after World War II in an effort to manage much of the ponderosa pine forest type using uneven-aged management (see articles by Munger and Keen regarding the maturity selection system, for example). This report includes the following sections: introduction, how the data were analyzed; the growth tables and how to use them; silvicultural significance of the findings; summary; and appendix.
Keywords: Columbia basin/Historical document/Partial cutting/Ponderosa pine/Silviculture/Timber management/ Western Montana/Uneven-aged management.

655. **Roeser, Jacob, Jr. 1924**. A study of Douglas fir reproduction under various cutting methods. Journal of Agricultural Research. 28 (12): 1233-1242. **Notes**: A photocopy of an original.
Abstract: This article describes a research study designed to examine regeneration of Rocky Mountain Douglas-fir. It was installed in the fall of 1913 on the Fremont Forest Experiment Station, which was located on the south slope of Pikes Peak on southern Colorado's Front Range. The study area consisted of a mature, mixed-species forest stand located at 9,100 feet elevation; it contained Douglas-fir, Engelmann spruce, limber pine, western yellow (ponderosa) pine, and quaking aspen. The experiment consisted of four, 200-foot by 200-foot treatment plots – plot number 1 was clearcut, number 2 was left untreated to serve as a control, number 3 received a shelterwood cut, and number 4 received a selection cut. After the treatments were installed, all advance reproduction under 4½ feet in height was removed so as not to interfere with future (post-treatment) seedling counts. To examine the effect of alternative slash treatment strategies, slash on the east half of each cutting treatment was scattered over the ground, whereas slash on the west half was piled and burned. Detailed measurements began to be collected in the fall of 1919, when the highest seedling count was present on the untreated control, followed by the shelterwood, selection, and clearcut treatments. Measurements from 1920 and onward did not find the highest seedling count to be on the control, as both the shelterwood and selection treatments consistently had higher numbers – often by double or triple the control's amount. This article contains the following sections: survival of seedlings; moisture a determining factor; slash scattering versus slash burning; humus depth and root length; height and protection correlated; and superiority of shelterwood. It was noted that 59% of the reproduction that was present in the untreated "virgin" stand as of the 1923 measurement was represented by 1923 seedlings, which were not expected to survive very long. That contrasted dramatically with the treated areas – on the shelterwood cut, for example, all but 6% of the seedlings were at least one year old, and only 1% of the selection cut's seedlings were new (current year). One objective of the study was to secure a new stand of Douglas fir to the exclusion of the other species, and the shelterwood and selection cuts came closest to meeting that desire. It was noted that soil moisture was abundant in the untreated stand early in the growing season and least in the clearcut area, but that moisture was most depleted in the untreated area by the end of the growing season and most abundant in the clearcut then. It appeared that differences in slash disposal had little impact, although Douglas-fir and Engelmann spruce exhibited a slight preference for the burned areas as indicated by their regeneration success. The author believed that the "natural debris resulting from logging operations should ordinarily furnish all the protection the seedlings will need." It was also found that protected seedlings were uniformly taller than unprotected ones, although the difference was greatest for Douglas fir and negligible for spruce. The most obvious conclusion was the superiority of the shelterwood method, not just in terms of securing reproduction, but especially in the growth and development of the seedlings. "The success secured in regenerating under shelterwood and to a great extent under selection cutting is so obvious that it is now planned to make the second cut on the shelterwood stand within the next two years."
Keywords: Historical document/Forest management/Front Range CO/Natural regeneration/Engelmann spruce/ Limber pine/Ponderosa pine/Quaking aspen/Rocky Mountain Douglas-fir/Pikes Peak/Fremont Experimental Forest.

656. **Rohn, Don C. 1926**. Price Ranger Station. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 8" x 10". **Notes**: An original copy.
Abstract: Very little is known about this photograph. The only information was on the front of the photograph was the year "1926" and "Price Ranger." Hand-written notations on the back of the photograph included "Don C. Rohn, Price Ranger Station, 1926." The photograph depicts two horses, one with rider and saddle and the other with a pack, posing near a log structure with a wooden-shingle roof. The area immediately adjacent to the structure had apparently been overgrazed for a period because it supports a dense stand of western coneflower (Rudbeckia

occidentalis), an allelopathic plant that increases following grazing and other disturbances. Behind the structure is a dense stand of Engelmann spruce and subalpine fir. The print quality is good; both the foreground and background portions are in sharp focus.
Keywords: Historical photograph/Blue Mountains/Umatilla NF/Walla Walla RD/Mountain meadows/Price Ranger Station.

657. **Rohn, Don C. 1930**. Target Meadows? U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 4 N., R. 38 E., sec. 28. **Size**: 8" x 10". **Notes**: An original copy.
Abstract: Very little is known about this photograph. The only notation was a hand written note on the back of the photograph stating "Don C. Rohn, Target [Largest?] Mds, 1930." It is unknown if the name on the back of the photograph is the person on the horse or the person who took the picture. The photograph depicts two horses, one with rider and saddle and the other with a pack, posing in a high-elevation meadow area with a dense stand of Engelmann spruce and subalpine fir in the background. Lying on the ground next to the horse with rider is a dog. The print quality is moderate; both the foreground and background portions are in relatively good focus.
Keywords: Historical photograph/Blue Mountains/Umatilla NF/Walla Walla RD/Mountain meadows/Target Meadows.

658. **Roth, Filibert**. **1902**. First book of forestry. Boston, MA: Ginn & Company. 291 p. **Size**: 6" x 8".
Notes: An original copy.
Abstract: This early work includes the following chapters: the wildwoods; raising or keeping up the forest; care and protection of the forest; use of the forest; the business of the forest; special kinds of forests; the forest as a protective cover; the forests of our country; some history; the wood; how to distinguish our common trees; and three appendices. The book includes 98 illustrations, many of which are excellent photographs.
Keywords: Historical document/Forest policy/Forest management/Watershed protection/Forest history.

659. **Roth, Filibert**. **1901**. Grazing in the forest reserves. In: U.S. Department of Agriculture, Yearbook of the Department of Agriculture. Washington, DC: U.S. Department of Agriculture: 333-348.
Notes: A photocopy of an original.
Abstract: This article was prepared by the Chief of the Forestry Division of the General Land Office, Department of the Interior. It describes administration of grazing in the early forest reserves. Topics include: general discussion of the functions of forests; the object of the reserves and the character of their forests; regulations for grazing in the reserves; present rules for grazing in the reserves; principles for future regulations for grazing in the reserves; extent of grazing in the reserves; methods of running stock and the effects on range and woods; sheep grazing; and cattle grazing.
Keywords: Cattle grazing/Forest reserves/General Land Office/Grazing/Historical document/Sheep grazing.

660. **Russell, Israel Cook**. **1897**. Water-supply and irrigation papers of the United States Geological Survey. No. 4. A reconnoissance [sic] in southeastern Washington. Document No. 344, House of Representatives, 54th Congress, 2nd Session. Washington, DC: Department of the Interior, United States Geological Survey. 96 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This report includes the following sections: introduction; climate; vegetation; topography and drainage; geological formations; irrigation; artesian water supply; and an outline sketch of the geological history of southeastern Washington.
Keywords: Historical document/Southeastern Washington/Watershed management/Water quality.

661. **Ruth, Robert H.; Yoder, Ray A. 1953**. Reducing wind damage in the forests of the Oregon coast range. Research Paper No.7. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 30 p. **Notes**: An original copy.
Abstract: Studies indicate that on average, storm winds affecting the Oregon Coast Range come from approximately south 30 degrees west. A survey of blowdown on the borders of clear-cut areas revealed that 93% of the wind damage occurred along the north and east boundaries and on the north slopes. An analysis of eight clear-cut tracts showed no correlation between wind damage and the size of the tract, but areas of 2 acres or less sustained considerable losses. Preliminary study of the comparative windfirmness of different species indicated that Douglas-fir and Sitka spruce are more windfirm than western hemlock. Trees infected with root rot were particularly susceptible to windthrow. Blowdown was more severe on areas with a high water table or very shallow soil.
Keywords: Wind damage/Western Oregon/Oregon Coast Range/Windthrow/Historical document.

662. **Rydberg, P. A. 1916**. Vegetative life zones of the Rocky Mountain region. Memoirs of the New York Botanical

Garden. 6: 477-499. **Notes**: A photocopy of an original.
Abstract: Rydberg was a prominent botanist affiliated with the New York Botanical Garden. He did extensive collecting and field studies in the Rocky Mountains. This article describes his observations and conclusions regarding vegetation zones in the Rocky Mountain region. He recognized 5 zones in the Rockies: alpine; subalpine; montane; submontane or foothills; and upper sonoran. These corresponded very closely to the five zones proposed by Dr. Merriam in the late 1890s, but had different names. The names proposed by Rydberg, which are still in usage today, were considered more consistent with nomenclature adopted in Europe. The alpine zone comprised the tops of the higher mountains above upper timber line. In Montana, the alpine zone might begin as low as 7,500 feet, whereas further south in the Rockies of southern Colorado, it might occur at 12,000 feet. The subalpine zone was synonymous with Merriam's Hudsonian zone. It included closed forests dominated by Engelmann spruce and subalpine fir, with admixtures of subalpine larch, bristlecone pine, whitebark pine, or limber pine, depending upon the locality. The montane zone corresponds to Merriam's Canadian zone. It is characterized by moderately open to closed forests of lodgepole pine, Douglas-fir, grand fir, white fir, ponderosa pine, western larch, quaking aspen, blue spruce, black cottonwood, Pacific yew, and western white pine, depending on geographic locality. This zone tends to have maximal species diversity, often supporting what is referred to as "mixed-conifer" forests. Since the low-elevation Blue Mountains and other transverse ranges allowed floristic elements of the Cascade and Rocky Mountains to intermingle, the two areas had more similarities in tree species in the montane zone than in other vegetation zones. The submontane or foothills zone corresponded to Merriam's transition zone. It contains a wide variety of plant communities, depending on locality. In many areas, the foothills zone supports "pygmy" or woodland forests dominated by pinon pine and/or junipers; in others, the dominant vegetation is medium to tall shrubland comprised of chokecherry, serviceberry, hawthorne, sumac, New Mexico locust, rose, snowberry, or other species. In central and southern Colorado, and much of central Utah, the foothills zone features Gambel oak shrublands. The upper sonoran zone is also referred to as the plains zone. It tends to be dominated by grasses and low- or mid-stature shrubs, and generally occurs in the valley bottoms or other areas of gentle topography at the lowest elevations. The article ends by summarizing 27 points in support of his proposed zones, although many of those points are just differences between Rydberg's proposal and Merriam's earlier proposal.
Keywords: Alpine zone/Historical document/Plant ecology/Rocky Mountains/Vegetational zonation/Plains zone/Foothills zone/Montane zone/Subalpine zone.

663. **Sampson, Arthur W. 1919**. Effect of grazing upon aspen reproduction. Bulletin No. 741. Washington, DC: U.S. Department of Agriculture. 29 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin reports the results of a study in commercial aspen forests of central Utah (Manti NF). Information was collected over a five-year period, 1912-1916. The effect of sheep and cattle grazing on aspen regeneration was examined in recent clearcuts. Varying grazing intensities were used, so that the differences between light and heavy grazing would be apparent. On sheep range, it was necessary to exclude grazing for 3 years after harvest to obtain satisfactory reproduction. No modification of cattle grazing was necessary in aspen clearcuts, as long as the range was not overstocked.
Keywords: Range management/Quaking aspen/Sheep grazing/Manti NF/Utah/Cattle grazing/Historical document.

664. **Sampson, Arthur W. 1917**. Important range plants: their life history and forage value. Bulletin No. 545. Washington, DC: U.S. Department of Agriculture. 63 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the results of a study initiated in 1907 to determine the habits, requirements, and life history of important range plants. The study was completed on the Wallowa National Forest in northeastern Oregon. Twenty grasses, 5 grasslike plants, and 18 forbs are described in this bulletin. Each species is accompanied by an illustration, most of which are a black and white photograph of a pressed herbarium specimen.
Keywords: Plant identification/Range management/Northeastern Oregon/Wallowa-Whitman NF/Historical document.

665. **Sampson, Arthur W. 1909**. Natural revegetation of depleted mountain grazing lands. Circular 169. Washington, DC: U.S. Department of Agriculture, Forest Service. 28 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular describes the results of grazing studies begun in 1907 on the Wallowa National Forest in the Blue Mountains of northeastern Oregon. Study objectives were to determine the relative importance of the forage species, including their abundance, distribution, seed habits, and forage value; the dates on which each principal forage species produces flowering stalks; the dates of seed maturity; rate and extent of revegetation by important forage species on overgrazed areas; plant species being favored by the grazing patterns and intensities being used at that time; and an evaluation of grazing practices that could restore the former productivity of depleted and

overgrazed rangelands. Much of the work reported in this bulletin centered on overgrazed areas that had previously supported mountain bunchgrass (*Festuca viridula*).
Keywords: Grazing damage/Range management/Grazing/Wallowa NF/Blue Mountains/Northeastern Oregon/Historical document/Festuca viridula.

666. **Sampson, Arthur W. 1919**. Plant succession in relation to range management. Bulletin No. 791. Washington, DC: U.S. Department of Agriculture. 76 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes major plant types of western rangelands, and describes the effect of grazing on plant succession in those types. The impact of destructive grazing on soil erosion is described, along with a discussion of forage production on driveways, bed grounds and other livestock concentration areas. The effect of grazing early in the growing season, prior to seed maturity, is compared to plant succession on similar areas that are not grazed. The use of plants as indicators of range condition is discussed in relation to the results of studies forming the basis for this bulletin.
Keywords: Range management/Grazing/Plant succession/Indicator plants/Historical document.

667. **Sampson, Arthur W. 1923**. Range and pasture management. New York: John Wiley & Sons. 421 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This book had three purposes: it was hoped that it would encourage land-grant colleges to include courses in range and pasture management in their curricula; it was designed to provide range management information for those who did not have the opportunity to attend college, but still needed to solve local pasturage problems; and it was designed to provide systematic instruction for those who desired a practical working knowledge in range management and hoped to work in the field, especially those who hoped to work for the U.S. Forest Service. Sampson considered that the absolute essentials of living were supplied by four industries: farming, livestock production, forestry, and mining. All other business enterprises were considered to be a result of one of the four basic industries. This book was intended to provide information about one of those four essentials – livestock production. It contains the following chapters: pasture lands and grazing control in the United States; national forest, state, and private grazing lands; reseeding western grazing lands to cultivated forage plants; natural reseeding and maintenance of native western pasture lands; improvement and management of farm pastures; recognizing and correcting a declining forage yield; principal introduced forage grasses; principal introduced nongrasslike forage herbs; control of erosion on range and pasture; grazing on woodlands and its relation to the future timber supply; burning of pasture lands and its effects on forage production; stock-poisoning plants and their control; principal stock-poisoning plants; poisonous and mechanically injurious plants of secondary or local importance; development of watering places for range and pasture stock; forage estimates as a basis for the rational use of grazing resources (grazing reconnaissance); grazing capacity and pasture inspection; research methods in range and pasture revegetation; and suggestions for instruction in pasture management and livestock production.
Keywords: Cattle grazing/Grazing/Grazing damage/Historical document/Livestock forage/Poisonous plants/Range history/Range management/Sheep grazing.

668. **Sampson, Arthur W. 1918**. Range preservation and its relation to erosion control on western grazing lands. Bulletin No. 675. Washington, DC: U.S. Department of Agriculture. 35 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin explores the relationship between livestock grazing and soil erosion. Grazing was found to influence stream flow and soil erosion by changing or destroying the ground cover. Results and recommendations were based on information from a study of high-elevation summer range in central Utah (Manti NF). Erosion from snowmelt, rain, and wind was examined. The last section of the bulletin provides preventive and remedial measures for areas with significant grazing programs.
Keywords: Range management/Soil erosion/Runoff/Manti NF/Utah/Historical document.

669. **Sampson, Arthur W.; Malmsten, Harry E. 1926**. Grazing periods and forage production on the national forests. Bulletin No. 1405. Washington, DC: U.S. Department of Agriculture. 54 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes range management practices being used on national forests of the West, including a discussion of the following topics: more and better forage; major forage types of the Wasatch Mountains; climatic factors in relation to grazing periods; determination of grazing periods; range management based on proper seasonal use; effect of frequency of pasturing on forage production and longevity of vegetation; why grasses are superior as forage plants; and range reseeding and natural revegetation.
Keywords: Range management/Livestock forage/Wasatch Mountains/Grazing/Utah/Historical document.

670. **Sankela, W. E.; Lynch, D. L. 1936**. Forest type map; north part of Umatilla and Union counties, Oregon. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station, Forest Survey Unit. 1:63360; [Projection unknown]; 26" x 21"; Colored Thematic. **Notes**: An original copy.
Abstract: This accession consists of 4 sheets that were trimmed down from the original maps in order to fit into a timber atlas binder. One or more of the sheets pertain to Union County, Oregon; the remainder of the sheets pertain to Umatilla County, Oregon. These sheets came from an early mapping effort that provided an impressive amount of detail. Not only were forest-type codes provided, but information about stocking (poor, medium, well), age (10-year classes), special species (western larch, Engelmann spruce, white pine) and a logging modifier are also present. Type codes allowed deforested burns and non-restocked cutovers to be tracked, with codes added later for drought-killed, insect-killed, or wind-thrown stands. Each of 41 different cover type codes was denoted using a unique combination of color and cross-hatching. The numbers of Castell or Dixon colored pencils are provided on the legend so that the official Forest Survey color scheme could be duplicated by map users. This detailed mapping effort at the County level formed the basis for generalized forest type maps that were produced for the states of Oregon and Washington (4 sheets per state). See Andrews and Cowlin (1936 and 1937) for two examples of the state-level mapping. [The Walla Walla District had an old timber atlas that contained the county-level sheets north of those in this accession. As of 1997, the atlas could no longer be located following a major reorganization of the District Office. The mapping, however, had been digitized before the reorganization (in 1994) and is available in the Forest's geographic information system. The four sheets in this accession were found in a timber atlas that had been maintained by the Pendleton Ranger District, which was combined with the Walla Walla District in the late 1970s. Some of the india-ink notations on the four map sheets were made by G. J. Tucker in March of 1947. Tucker is known for his "History of the Northern Blue Mountains" (1940).]
Keywords: Blue Mountains/Forest types/Historical map/Maps/Northeastern Oregon/Union County OR/Umatilla County OR.

671. **Sankela, W. E.; Lynch, D. L. 1936**. Legend and type definitions; forest type map for Umatilla and Union Counties, Oregon. Unnumbered Published Map. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station, Forest Survey Unit. 5 p. **Size**: 6" x 11". **Notes**: An original copy.
Abstract: This accession consists of the legend and type definitions for 4 map sheets that show forest cover types for portions of Union County and Umatilla County, Oregon. [See Sankela and Lynch (1936), "Forest type map; north part of Umatilla and Union counties, Oregon" for information about the actual map sheets.] Each of 41 different cover type codes was denoted using a unique combination of color and cross-hatching. The numbers of Castell or Dixon colored pencils are also provided on the legend so that the official Forest Survey color scheme could be duplicated by map users. Note that this "legend and type definitions" item was cut off the original maps and glued into the inside cover of an timber atlas; therefore, the maps are available as one item containing four sheets, and the legend describing the map attributes is this accession and unfortunately must be stored separately from the original maps.
Keywords: Blue Mountains/Forest types/Historical map/Northeastern Oregon/Union County OR/Umatilla County OR.

672. **Sankela, Wm. E. 1937**. Forest statistics for Morrow County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 11 p.
Notes: A photocopy of an original.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Morrow County's forests that was completed in 1936. A small-scale map showing the distribution of theforest and nonforest zones is also included. The following topics are discussed: location and description of the county; nonforest zone and agricultural development; the forests (sawtimber and immature); noncommercial and woodland types; productive capacity of forest land; volume of merchantable timber; ownership of forest land; and depletion and logging conditions. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest inventory/Morrow County OR/Umatilla NF/Historical document.

673. **Sankela, Wm. E. 1937**. Forest statistics for Umatilla County, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 13 p.
Notes: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present con-

sumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report describes the results of an inventory of Umatilla County's forests that was completed in 1936. A small-scale map showing the distribution of forests, juniper woodlands, and nonforest areas is also included. The following topics are discussed: location and description of the county; the vegetative zones; forest types; productive capacity of forest land; volume and quality of the timber; forest ownership; economic development; forest industries, and other forest uses. Area and volume tables are included after the narrative descriptions. Bar chart figures summarize important forest statistics.
Keywords: Forest Inventory/Umatilla County OR/Umatilla NF/Wallowa-Whitman NF/Umatilla Indian Reservation/Historical document.

674. **Sargent, C. S. 1890**. The forests on the public domain. Garden and Forest. 3: 13-14.
Notes: A photocopy of the original article published on January 8, 1890.
Abstract: This article is in response to an address made by John Wesley Powell (Director of the National Geological Survey) on December 5, 1889 to the Chamber of Commerce for New York City. Powell's address was entitled "Problems of Irrigation." In that address, Powell advocated "that the entire arid region be organized into natural hydrographic districts, each one to be a kingdom within itself, for the purpose of controlling and using the great values which have been pointed out. The plan is to establish local self-government by hydraulic basins, and each basin may constitute a great country." Sargent, who does not seem to agree with that plan, proposes that a Commission be established to examine the forests of the public domain so that debate about their welfare can be based on solid information. His recommendation was: "the forests and the lands of the public domain belong to the people of this state as much as to any other local community. The nation holds this vast wealth in trust for future generations. It should ascertain its nature and extent, and then determine wisely what arrangements will be best adapted for its permanent administration."
Keywords: Historical document/Forest policy/Land use planning/Forest history.

675. **Sargent, Charles S. 1884**. Report on the forests of North America (exclusive of Mexico). Unnumbered Report for the Tenth Census of the United States. Washington, DC: U.S. Department of Interior, Census Office. Variable p.
Notes: A photocopy of an original.
Abstract: This report had 3 parts, as follows: part 1, the forest trees of North America, exclusive of Mexico; part 2, the woods of the United States; and part 3, the forests of the United States in their economic aspects. Not all of this report was copied due to its length. The following sections were copied: description of the forests of North America (pages 3-16 from part 1), and the description of the "western division" from part 3 (564-580, not counting maps which did not have page numbers). The western division narratives describe forest conditions on a state-by-state basis. For many states, forests are also described by county or for groups of counties. Each state narrative is accompanied by a map showing forest distribution, and a classification of forests based on density. Density mapping was based on volume (cords) per acre. Unfortunately, the maps are very large scale and were in color, so did not photocopy very well.
Keywords: Eastern Oregon/Forest history/Historical document/Maps/Northeastern Oregon/Grant County OR/ Umatilla County OR/Union County OR/Columbia County WA.

676. **Sargent, Charles Sprague**. **1905**. Manual of the trees of North America. Boston, MA: Houghton, Mifflin and Company. 826 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This large, classic work describes all trees of North America, exclusive of Mexico. Many of the species (644 in all) are illustrated with line drawings. A wide variety of information is provided for each species, including a description of its foliage, flowers, fruit, bark, wood, and the distribution.
Keywords: Historical document/Dendrology/North America.

677. **Saunderson, Mont H. 1950**. Western stock ranching. Minneapolis, MN: The University of Minnesota Press. 247 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: Management of a stock ranch required thorough, specialized knowledge of the land, the livestock, and the financial methods involved. This book was prepared by a U. S. Forest Service range economist with long experience in the working problems of sheep and cattle ranching. The business of ranching is analyzed in terms of markets, prices and incomes, management standards and guides for production, financial planning and reports, production cost analysis, ranch appraisal, rangeland management, and procedures for use of government lands. The various natural regions of the West are surveyed and the types of ranches found in each section are described. This book includes the following chapters: resources and ranches; livestock management economics; grazing land use; choice of feed crops for ranch use; markets, prices, and incomes; business management; planning the management program of the ranch; and the use of federal public lands. Photographs, tables, sample accounting forms, actual case

histories, a bibliography, and an index are also included.
Keywords: Cattle grazing/Grazing/Historical document/Livestock forage/Range management/Sheep grazing/Range economics.

678. **Schmitz, J. M. 1962**. The early days of the Wenaha Forest Reserve. Timberlines. 16 (June): 90-94.
Notes: A photocopy of an original.
Abstract: This account begins with Schmitz arriving in Walla Walla, Washington on August 8, 1905. He was the first Supervisor of the Wenaha National Forest. His first order of business was to straighten out the grazing situation on the Forest, since it was being severely overgrazed. He describes taking compass measurements that showed that the Forest map was incorrect, requiring that he correct the location of Table Rock and other important landmarks by as much as 2 miles. Schmitz describes a major meeting of stockmen in Walla Walla during December of 1905, when hundreds of cattle and sheep grazers formed a committee to divide up the grazing ranges into allotments and apportion them between cattle and sheep. He also describes his first instance of timber trespass, when 2 men from Dayton came to the office and admitted they had cut some wood on the National Forest. Schmitz made a sale to the men, but was criticized by the Regional Office for not handling it as a trespass. He also describes a 1000-acre wildfire in 1910 that burned in the Eden country. It was finally controlled when backed into a bluff near the Grande Ronde River. This article was based on notes taken by Mr. Schmitz's daughter as told to her by her father around 1943.
Keywords: Forest history/Historical document/Umatilla NF/Wenaha NF.

679. **Schmitz, J. M. 1906**. Report on an examination of the proposed addition to Wenaha Forest Reserve, Oregon. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 9 p. **Notes**: A digital version of this report is available; filename: Wenaha6. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This short report describes conditions in a proposed addition to the Wenaha Forest Reserve in Umatilla County, Oregon. The examined area comprised about 70,000 acres. The report includes the following sections: topography; climate and precipitation; the forest; industries; settlement; roads and trails; lumbering; grazing; fires; sentiment; conclusion; administration; and rangers camps. Schmitz provides some interesting insights, as demonstrated with these quotes: "Very little damage has been done by fire. There are a few small burnt tracts but they are so scattering and of small area that they are hardly worth considering. There is very little cultivated land. The country is too rough for cultivation. A few small patches are being cultivated in the canyons." "Very little lumbering has been done on the proposed addition. About 500,000 feet B.M. has been cut on the east fork of Meacham Creek. It was only culled over and no harm was done to the forest cover. There will be little or no lumbering for several years. The timber is too scattering to make it profitable. Some cordwood may be cut in the southwestern part."
Keywords: Historical document/Wenaha NF/Wenaha Forest Reserve/Blue Mountains/Umatilla NF/Forest management/Range management.

680. **Schopmeyer, C. S.; Helmers, A. E. 1947**. Seeding as a means of reforestation in the northern Rocky Mountain region. Circular No. 772. Washington, DC: U.S. Department of Agriculture. 31 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular covers the following topics as related to direct seeding in Montana, northern Idaho, and northeastern Washington: factors affecting the success of seeding, and the studies conducted to determine them; development of practical seeding methods for western white pine, ponderosa pine, western redcedar, and Engelmann spruce; comparison of broadcast and spot sowing; experiments with poisons for rodent control; comparative costs of direct seeding and tree planting; possibilities for use of direct seeding in forest management; and research needed for direct seeding in the future.
Keywords: Direct seeding/Artificial regeneration/Montana/Northern Idaho/Northeastern Washington/Western white pine/Ponderosa pine/Western redcedar/Engelmann spruce/Animal damage control/Historical document.

681. **Scidmore, Eliza Ruhamah**. **1893**. Our new national forest reserves. Century Magazine. 46 (Sept.): 792-797.
Notes: A photocopy of an original.
Abstract: This early articles discusses the 15 original forest reserves that had recently been set aside by President Harrison. The author states that the reserves had been created to: moderate climate and equalize temperatures; guard, preserve, and regulate water supplies; and preserve and cultivate timber supplies for the time when the existing reckless and wasteful lumbering practices would have exhausted all other forests. The author compares U.S. policies with the European situation where forests return an annual profit of $2.50 per acre, whereas American forests in the public domain were being sold for the same amount.
Keywords: European forestry/Forest history/Forest reserves/Historical document.

682. **Sears, Paul B. 1921**. Vegetation mapping. Science. 53 (1371 (April 8)): 325-327.
Notes: A photocopy of an original.
Abstract: This short article describes several early methods of preparing vegetation maps. One of those methods involves use of early survey notes from the General Land Office, which are valuable because bearing or witness trees were described for each section corner in the survey. Since the descriptions of bearing trees were usually accurate, the survey notes can be used as a crude estimate of the distribution of forest vegetation at the time of the survey. The author describes a transcription system he developed involving assignment of unique symbols to each tree species, which were then used on a base map during interpretation of survey notes to determine species composition along section lines. Although bearing tree information is only available at an interval of one mile (each section corner is one mile from the previous one), the author still found the G.L.O. survey notes to be an acceptable tool for constructing vegetation maps. The author also discusses the use of airplane reconnaissance for vegetation mapping; he formed those opinions when stationed at an air base in 1918 during World War I.
Keywords: Forest mapping/General Land Office/Historical document/Presettlement vegetation/GLO survey notes.

683. **Shanks, Royal E. 1954**. Plotless sampling trials in Appalachian forest types. Ecology. 35 (2): 237-244.
Notes: A photocopy of an original.
Abstract: Quantitative data are essential for an adequate characterization of vegetation conditions. An effective sampling method for use in ecological studies would be: adaptable for use in rapid reconnaissance work as well as in intensive studies of small areas; operable by one person at a reasonably efficient level; and susceptible to statistical analyses of variability. This article describes a promising new technique for plotless forest sampling developed in Germany by Bitterlich. This variable-radius plotless method, which was introduced to American forestry by Grosenbaugh, involved the use of a simple device called a hand-held angle-guage (i.e., a glass prism) to determine which trees were within a distance that was no greater than 33 times their diameter from the sample point. This paper compared the results obtained from three different sampling methods: tenth-acre plots, variable-radius "plotless" samples, and random-pairs sampling. The random pairs method of ecological sampling involves the use of an angle of exclusion to select two individuals (plants, trees, etc.) as a sample unit. The individual closest to a sample point (a stake or other point in or on the ground) is located first, and an angle then delimited with its vertex at the sample point and its bisector on the closest individual. Any other individual plant falling within this angle is excluded, and the distance is measured between the individual closest to the sample point and the individual nearest to it that is also outside of the angle of exclusion. The author found that the data was surprisingly consistent and that both of the plotless methods (variable-radius and random-pairs) were rapid as compared to plot sampling. Both of the plotless methods were acceptable for rapid reconnaissance purposes and could be used by one person. Since variable-radius sampling yielded more data than the random-pairs method, it was considered superior for most purposes, although the random-pairs approach was more useful at providing details about tree spacing in a forest. The random-pairs method had several potential shortcomings: a tendency to under-represent species that are clumped in their natural distribution; a skewed data distribution for number of trees or basal area due to a small sample size bias; and the influence of an extremely small sample size on species frequency.
Keywords: Ecology/Forest inventory/GLO survey notes/Sampling/Random pairs sampling/Variable-radius sampling.

684. **Shantz, H. L. 1911**. Natural vegetation as an indicator of the capabilities of land for crop production in the Great Plains area. Bulletin No. 201. Washington, DC: U.S. Department of Agriculture, Bureau of Plant Industry. 100 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This paper includes the following topics: introduction; general considerations on the use of vegetation as an indicator; plant formations and associations in eastern Colorado; associations in eastern Colorado which indicate land of agricultural importance; associations in eastern Colorado indicating nonagricultural land; relationship of the different associations; crop production on land characterized by different types of vegetation; summary; conclusions; description of plates; and index. The paper contains many plates and line drawings illustrating important plant species mentioned in the text.
Keywords: Colorado/Agriculture/Historical document/Indicator plants/Soils/Vegetation classification/Great Plains.

685. **Shantz, H. L.; Zon, Raphael**. **1924**. The natural vegetation of the United States. Atlas of American Agriculture; Part I, Section E. Washington, DC: U.S. Department of Agriculture. 29 p. **Size**: Oversized (copied on 11" x 17" paper). **Notes**: A photocopy of an original.
Abstract: This interesting work describes vegetation types of the United States. Both grassland and forest types are described. Forest vegetation is described by region, with one narrative for the western forest region and another for eastern forests. Many different forest types are described for western forests, including pinon-juniper, yellow pine, Rocky Mountain Douglas-fir, lodgepole pine, and larch-Douglas-fir for interior areas. Coastal or westside forest

types are also described. The report also includes liberal use of maps, charts, and photographs, most of which are of high quality.
Keywords: Forest ecology/Historical document/Maps/Vegetation classification/Forest types.

686. **Sheldon, Edmund P. 1904**. The forest wealth of Oregon. Unnumbered Report. Portland, OR: State of Oregon, Lewis and Clark Exposition Commission. 32 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This report was issued during preparations for the Lewis and Clark Fair, which was held in Portland in 1905 to mark the centennial of Lewis and Clark's arrival at the mouth of the Columbia River in 1805. The report discusses the following topics: climate, history, and Oregon's forests; Oregon's forests as a resource; and a short description of 95 important trees and shrubs in Oregon.
Keywords: Historical document/Forest history/Silvics/Oregon/Plant identification.

687. **Show, S. B. 1920**. A study of some of the physical controls of fires. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 19 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report was based on data obtained from the individual fire reports of twelve "timber" forests in California, covering a period of 6 years (1914 to 1919 inclusive). On each of those reports, information was provided about the degree and direction of slope under which the fire occurred. The data were tabulated in such a way as to examine the general relationship between degree of slope and aspect and the spread rate of fires. The relationships derived were general rather than specific, but it was believed they represent the relative values that actually exist in general practice. The relationships were developed from an analysis involving 6,872 fires. Since some of the individual fire reports used qualitative measures of slope steepness, the analysis utilized five categories of slope steepness: level, 0-5%; gentle, 5-15%; medium, 15-30%; steep, 30-60%; and precipitous, 60%+. When analyzing aspect, fires on northeast and northwest slopes were grouped with those that occurred on north-facing exposures, and fires on southeast or southwest aspects were grouped with those on south slopes. As criteria for rate of spread, the author used the percentage of "C" fires (those over 10 acres in size), the size of average class C fires, and the size of the average fire. The results of the analyses are provided in six charts, included at the end of the report. Chart #1 shows the percentage of class C fires on slopes of varying steepness and of differing aspect. That chart shows striking differences between north and south slopes, and that the percentage of class C fires increases quite rapidly and linearly as the slope steepness increases. Chart #2 shows similar data for class "A" fires (those less than one-quarter acre in size). In general, the shape of the curves in chart #2 is a reciprocal of the curves portrayed in chart #1. Chart #3 shows the percentage of class C fires on different aspects for the different groups of forests. Chart #4 shows the average size of class C fires and of all fires for slopes of differing aspect. Chart #5 shows the relative seasonal importance of fires on different aspects. Those curves show fluctuations through the fire season for south slopes, but very little difference for east- or west-facing exposures. Chart #6 has some of the same information as on chart #5, but it is shown as a probability relationship. An analysis was also completed that examined the relationship between fire spread rate and cover conditions. That analysis showed that there were over twice as many C fires in brush as in timber and, conversely, the percentage of A fires was twice as high in timber as in brush. Those results also provide one of the reasons for the high percentage of class C fires on south slopes, since southerly aspects tended to have a higher proportion of brush cover than north slopes. A summary of results from this study was: the percent of class C fires was twice as high on south slopes as north slopes and three and one-half times as great as on level areas; east and west slopes occupy an intermediate position between north and south slopes and that the relative position varies between groups of forests; the percent of C fires varies directly with slope steepness; early and late in the fire season, a very high percentage of all fires occur on south slopes; and that fires in brush spread more rapidly than those in timber.
Keywords: Forest fires/Fire effects/California/Historical document/Fire control.

688. **Show, S. B.; Greeley, W. B. 1926**. Timber growing and logging practice in the California pine region. Bulletin No. 1402. Washington, DC: U.S. Department of Agriculture. 75 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes common logging and forest management practices applied in the California pine region, including a discussion of the following topics: measures necessary to keep forest lands productive; role of advance reproduction and seed trees in the region; fire protection and slash disposal measures; logging methods employed; cutting intensities used; grazing on cut-over lands; protection against forest pests; and measures necessary to produce full timber crops.
Keywords: Forest management/California/Ponderosa pine/Silvicultural systems/Historical document.

689. **Show, S. B.; Kotok, E. I. 1929**. Cover type and fire control in the national forests of northern California. Bulletin No. 1495. Washington, DC: U.S. Department of Agriculture. 35 p. **Size**: 6" x 9".
Notes: An original copy. Also a photocopied version with 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes important forest cover types of northern California and their associated fire control problems, including a discussion of the following topics: cover types of northern California; the fire problem and the need for an index of fire danger; study methods; number and seasonal distribution of fires by forest type; and fire control as affected by the forest type they occur in.
Keywords: Northern California/Fire effects/Fire control/Historical document.

690. **Show, S. B.; Kotok, E. I. 1930**. The determination of hour control for adequate fire protection in the major cover types of the California pine region. Technical Bulletin No. 209. Washington, DC: U.S. Department of Agriculture. 46 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in August, 1930.
Abstract: The major purpose of this bulletin is to address one major objective of forest fire control – what speed of attack is needed in order to hold burned acreage to an accepted minimum amount (that time frame is referred to as "hour control")? The report includes the following sections: the fire-protection problem; methods of study; basic relationships in determining hour control; determination of hour control for different types (nine vegetation types); time allowance for travel in setting up hour control; conditions affecting travel time; factors affecting application of the method; conclusions; and an appendix that describes the cover types of northern California.
Keywords: Forest fires/Historical document/Fire control/Forest types/Northern California.

691. **Show, S. B.; Kotok, E. I. 1925**. Fire and the forest (California pine region). Department Circular 358. Washington, DC: U.S. Department of Agriculture. 19 p. **Size**: 6" x 9".
Notes: An original copy. Also a photocopied version with 2 pages side by side on 8½" x 11" paper.
Abstract: This circular describes the effects of forest fires on ponderosa pine forests in California, including the following topics: cumulative nature of fire damage; kinds of fire damage, including fire scars, tree killing, crown injury, reduced tree growth, seedling mortality, and fire as an aid to pest control; what the California brush fields mean; the final stage of forest deterioration; fire on cut-over lands; progressive deterioration caused by repeated fires; watershed damage; the theory of light burning; legitimate use of fire in the practice of forestry (slash disposal and snag burning); promiscuous forest burning; fire exclusion as an essential practice for forest restoration; and the role of fire as a destroyer.
Keywords: Forest fires/Fire effects/California/Ponderosa pine/Historical document.

692. **Show, S. B.; Kotok, E. I. 1937**. Principles of forest-fire detection on the national forests of northern California. Technical Bulletin No. 574. Washington, DC: U.S. Department of Agriculture. 32 p. **Size**: 6" x 9".
Notes: An original copy. Issued in August, 1937.
Abstract: The purpose of this bulletin is to describe many of the principles of forest fire detection, including provision of detection standards in terms of both time and distance. It includes the following sections: the fire-detection problem; the place of different agencies in the detection system; adequacy of primary lookout service; the effective range of vision for lookouts; the goal in lookout coverage detection; detection results from a planned primary lookout system; and summary and conclusions. The major conclusion of this study was that 70- to 75-percent detection coverage should be provided for high-risk fire zones, and that such a detection system is generally possible at a justifiable cost.
Keywords: Forest fires/Historical document/Fire control/Northern California/Fire detection.

693. **Show, S. B.; Kotok, E. I. 1924**. The role of fire in the California pine forests. Bulletin No. 1294. Washington, DC: U.S. Department of Agriculture. 80 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin provides a comprehensive discussion of fire's role in the pine region of California, including the following topics: fire history of the region; data from fire scars; recurrence of fire years; causes of earliest fires; fires in the virgin forest; crown injuries and rate of growth; indirect physical damage to mature timber; fire damage to young growth; the process of fire-caused attrition; fire in second-growth stands; effect of repeated surface fires; fire damage on cut-over areas; fire in brush fields; damage to watersheds; light burning; results of light burning; possible beneficial uses of fire; fire's use in slash disposal, in other protective measures, in silvicultural practice, and as an aid in grazing; the relation of damage to forest management; and the theory of fire protection as controlled by fire damage. It includes some interesting insights, as illustrated with this quote: "Physical conditions in the pine forests of California have led to the frequent recurrence of fires for centuries, but the fact that magnificent forests still cover large areas and give the appearance of well-stocked, vigorous stands has blinded the public to the harm that fires have done and are steadily working throughout the whole region. Were it possible for the observer to visualize the entire area on which pine has grown, and to behold it truly fully stocked, he would then see

by comparison that the present California pine forests represent broken, patchy, understocked stands, worn down by the attrition of repeated light fires."
Keywords: Fire effects/California/Ponderosa pine/Historical document.

694. **Show, S. B.; Kotok, E. I.; Gowen, George M.; Curry, J. R.; Brown, A. A. 1937**. Planning, constructing, and operating forest-fire lookout systems in California. Circular No. 449. Washington, DC: U.S. Department of Agriculture. 55 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in November, 1937.
Abstract: This document describes the principles upon which a fire lookout system should be based. Applicable methods and a special technique – preparation of visible-area maps – pertaining to fire lookout development are discussed in detail. The following topics are covered in this circular: introduction; planning and developing a detection system; the lookout structure and facilities; the lookout man; the cost of adequate detection by lookouts; and appendices.
Keywords: Fire prevention/Forest fires/Historical document/Fire control/Fire lookouts/Fire detection.

695. **Shreve, Forrest**. **1917**. A map of the vegetation of the United States. The Geographical Review. 3 (2): 119-125.
Notes: A photocopy of an original.
Abstract: This article describes a vegetational classification for the United States. Eighteen vegetation types are described, and are also portrayed on a color map at a scale of 1:9,600,000 (map in library copy is not in color). The types are very broad; most of the Blue Mountains forest is shown as one type – western xerophytic evergreen forest. The vegetation map was prepared during an effort to correlate climatic influences with vegetation distribution.
Keywords: Vegetation classification/Forest mapping/Forest types/Historical document.

696. **Sievers, A. F. 1930**. American medicinal plants of commercial importance. Miscellaneous Publication No. 77. Washington, DC: U.S. Department of Agriculture. 74 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This document describes a wide variety of plants that have been routinely collected for medicinal uses. Each description includes the following items: common and scientific name, synonyms, other common names, habitat and range, botanical description, other associated species, and part used. Each plant is illustrated with one or more photographs or line drawings.
Keywords: Medicinal plants/Plant identification/Historical document.

697. **Silcox, F. A. 1911**. Railroad fires. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 20 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: After half a century of disastrous losses from forest fires, the railroads of the United States were seemingly just beginning to recognize their responsibility for a great deal of that loss. The reason for the destructive losses was clear – when a shower of sparks was either blown through the stack of a locomotive or trailed out from its fire box into highly flammable material, the resulting forest fires were inevitable. Statistics compiled by State Foresters and State Forestry Commissions showed that the railroads were responsible for from 15 to 60 percent of the fires. Reports from the U.S. Forest Service showed that railroads were responsible for 40 percent of fires started on the national forests. Silcox then provides a series of tables summarizing the percentage of fires attributable to railroads for a selection of States, along with pertinent comments from the State reports. He also summarizes reports from Europe (Bavaria, France, Italy, Sweden, etc.), where railroads were an insignificant cause of forest fires. Many early railroad fires in the United States were blamed on the locomotives, since they had a draft arrangement where air was forced directly from a fire box out through the stack, carrying live embers with it. Later designs incorporated a return draft arrangement where air and cinders were forced back into the fire box before finally being ejected from the stack. At the time this report was written, a satisfactory spark arrester had not yet been developed. In fact, a truly effective spark arrester was considered infeasible since it would interfere too much with operation of the locomotive's engine. Since an effective spark arrester was not expected in the near future, and because it was not anticipated that railroads would adopt oil or electricity as their primary fuel source, the author believed the most efficacious way to reduce railroad-caused fires was to emphasize clearing and cleaning of railroad rights-of-way. He presents many recommendations about clearing methods and clearing widths to be employed along railroad tracks. He also urges the use of constant patrols along the rights-of-way in order to detect fires early and to extinguish them while still small.
Keywords: Fire control/Fire prevention/Forest fires/Historical document/Railroad fires.

698. **Silcox, F. A.; Norcross, T. W. 1935**. Umatilla National Forest visitor's map (north and south halves). Portland, OR: U.S. Department of Agriculture, Forest Service. 1:253440; Polyconic; 18" x 25" and 18" x 21"; Thematic.

Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a general visitor's map of the Umatilla National Forest. It occurs on two sheets – one for the north half of the Forest, the other for the south half. The base map was compiled at the Washington Office in 1922 and was based on USGS, Government Land Office, Forest Service and other surveys. Base information was revised in Portland, Oregon in June of 1935. The legend includes the following items: the Umatilla NF boundary, adjacent national forest boundaries, good motor roads, poor motor roads, trails, railroads, telephone lines, the Supervisor's headquarters, Ranger stations, Guard stations, permanent lookout stations, triangulation stations, and houses, cabins or other buildings.
Keywords: Historical map/Maps/Umatilla NF.

699. **Silver, James; Moore, A. W. 1941**. Mole control. Conservation Bulletin 16. Washington, DC: U.S. Department of the Interior, Fish and Wildlife Service. 17 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This bulletin includes information about how to control 4 different species of moles. Unlike rodents, moles live chiefly upon earthworms and insects that inhabit the ground. They are beneficial to the extent that they destroy harmful insects, and no control should be initiated against these animals in situations where their burrowing does no damage. In cases where their burrows damage lawns, golf courses, and nurseries, mole control will likely be needed.
Keywords: Animal damage control/Historical document/Rodent repellents/Mole control.

700. **Simson, A. Gael**. **1926**. An analysis of smoking hazards. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 32 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: After the advent of the automobile, which rendered much of the national forests easily accessible to the sportsman and tourist, the number of smoker-caused fires increased. At the time this report was written, they had increased to the point where they represented an appreciable portion of the annual fire fighting budget. In 1924, the peak year up to that point, smokers caused 342 fires on the national forests of Oregon and Washington. As a result of those fires, drastic measures became necessary and in 1925, over a million and a half acres of national forest land were closed to smoking. As a result, the number of smoker-caused fires in 1925 was 214, a reduction from 1924 of more than a third. The closures resulted in a storm of protest, with "pipe addicts" claiming that cigarette smokers were the culprits and only they should be banned from the forest. Some logging camps quit selling "tailor-made" cigarettes but continued to sell "the makin's" (papers and tobacco), whereas others would sell neither. Since legislation related to this problem was being considered, and since any attempt to ban all smoking in the forests would create adverse public sentiment almost as detrimental as unrestricted smoking, it was decided to initiate a study to determine which forms of smoking tobacco were responsible for forest fires, and which conditions were most conducive to smoking-caused fires. In order to complete the study, ten brands of tobacco product (cigarettes and cigarette material) and two brands of matches were used. This document reports the results of the study; it includes the following sections: material and equipment; instruments; fuels tested; methods and procedure; fuel moisture determinations; heat measurements; method of studying effect of draft and fuel moisture; presentation of data and discussion; matches; cigarettes and pipe heels; summary of results; and application of results. Some of the important results from the study were: matches were the only smokers' materials starting fires in dead weeds, fern, and duff; due to the relatively large areas of those fuel types, matches probably caused most of the smokers' fires; tailor-made cigarettes containing Turkish tobacco, either wholly or in part, were the worst of the tobacco offenders in terms of starting fires; hand-made cigarettes and Imperials were relatively innocuous from a fire-starting standpoint; and fires from burning tobacco could be expected on decayed, disintegrating Douglas-fir and hemlock logs any time after the moisture content of the top half-inch of the rotten wood falls below about 14% of the oven-dry weight. The final conclusion was that "as the three important factors in the start of smoker fires are matches, Turkish-domestic blend cigarettes and rotten wood, any move to materially reduce the number of smoker fires will have to be along the lines of suppressing one or more of the causative agencies at least during the most dangerous period of the year."
Keywords: Fire prevention/Forest fires/Historical document/Pacific Northwest Region/Smoker-caused fires.

701. **Skinner, Edgel C. 1955**. Log position volume tables for western conifers. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. Variable p. **Notes**: An original copy.
Abstract: Board-foot volumes by the Scribner rule for individual logs in coniferous trees of western species are shown in these tables. This information is important for estimating standing timber volumes by log grades and for estimation of cull volume from gross cruise estimates. Individual log volumes are given for trees with form classes from 65 to 90, diameters at breast height from 10 or 12 to 90 inches, and merchantable heights from 1 to 11 logs.

Keywords: Timber volume/Volume tables/Tree volume/Historical document.

702. **Smith, Dwight R. 1967**. Effects of cattle grazing on a ponderosa pine-bunchgrass range in Colorado. Technical Bulletin No. 1371. Washington, DC: U.S. Department of Agriculture, Forest Service. 60 p. **Size**: 6" x 9".
Notes: An original copy. This publication is a revision of, and replacement for, USDA Circular 929, published in December, 1953.
Abstract: This bulletin covers the following topics as related to long-term studies of cattle grazing on the Manitou Experimental Forest in the Front Range of south-central Colorado: description of the study area; experimental methods, including grazing treatments applied and measurements collected; forage utilization by cattle; plant responses to grazing intensity, including cover changes by vegetation type and plants favored by light or heavier grazing; plant growth and herbage production; soil responses to grazing intensity; and cattle responses to grazing intensity (weight gains and beef production).
Keywords: Ponderosa pine/Cattle grazing/Range management/Bunchgrass ranges/Historical document/Colorado/ Front Range CO/Manitou Experimental Forest.

703. **Smith, E. C.; Durrell, L. W. 1944**. Sedges and rushes of Colorado. Technical Bulletin 32. Fort Collins, CO: Colorado State College, Colorado Agricultural Experiment Station. 63 p. **Size**: 6" x 9".
Notes: An original copy, although missing the front cover.
Abstract: This bulletin describes the sedges and rushes of Colorado. It includes the following sections: introduction; distribution of species; palatability; methods of keys and descriptions; methods of collection; key to families; illustrations, forming a visual key to the genera; keys and descriptions of genera and species; glossary; and index. Plant keys, illustrations, and short descriptions of numerous species are contained in this document.
Keywords: Botany/Colorado/Historical document/Plant identification/Rushes/Sedges.

704. **Smith, Kan; Weitknecht, Robert H. 1915**. Windfall damage on cut-over areas, Whitman National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 85 p. **Notes**: A digital version of this report is available; filename: Whitman3. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This comprehensive report describes a study to determine the impacts of windfall associated with cut-over areas on the Whitman National Forest. As of 1915, about 6,000 acres of yellow pine forest had been cut over using the selection silvicultural system; all of the sales had been sold since 1910. The marking on selection sales emphasized leaving about 20% of the thriftiest, soundest, and youngest trees distributed evenly across the sale area. On May 26, 1913, a windstorm blew down 792 yellow pines on 880 acres of cutovers on the W. H. Eccles sale area. Then, on September 18, 1914, another severe storm blew over 808 yellow pines on the 1,624 acres that had been cut-over up to that time. This meant that in aggregate, almost 18% of the reserve stand had been blown over in just two years. Following those windthrow episodes, this study was initiated in an attempt to correlate windfall with site factors (topography, aspect, etc.) or tree characteristics (tree height, crown size, crown density, etc.). The report includes the following sections: introduction; objectives of the investigation; description of study areas (Eccles area, PW-1 plot, Baker white pine area); methods of gathering data; tabulations and numerical results; height curves; influence of crown class on windfall; influence of trunk character on windfall risk; relation of windfalls to soil, rock and root systems; effects of distribution on windfalls; influence of topography on windthrow; meteorology; general topography; volumes of windthrown timber; windfall in areas other than those studied; other forests; reproduction; maps; conclusions; recommendations; and photographs. The report ends with 9 pages of photographs (10 photographs). An extremely detailed, large-format map (1-inch equals 50 feet) of the PW-1 plot on the W. H. Eccles sale area is also included. The map shows the location of every stump on the surveyed area, along with all live or windthrown trees. For the windthrown trees, their direction of fall is shown with an arrow. A 4-page memorandum from the District (Regional) Forester to the Forest Supervisors in District 6 is also included. The memo, signed by Assistant District Forester Ames, summarizes important results of this study and states that marking guides will not be changed as a result of this study because the "information was collected in a single locality, and in other timber sales in yellow pine throughout the District the loss by windfall has not been excessive." According to the Ames memo, a 16-inch to the mile topographic map of the study areas was also prepared, but a copy of that map was not found at the National Archives. A 2-page memo from a Forest Inspector (name unknown) is also included (dated July 31, 1917); it describes the inspector's visit to the Whitman NF in June of 1917, along with Assistant District Forester Ames, and their discussions with the local force regarding their use of the windfall report and its effect on their marking. Ames and the inspector felt that concern for windfall was being over-emphasized on the Forest, and that windfall risk not be given so much weight during timber sale marking.
Keywords: Historical document/Whitman NF/Windthrow/Blue Mountains/Ponderosa pine/Timber harvesting/ Wallowa-Whitman NF/Selection cutting.

705. **Smith, R. E. 1909**. Divide head of Fly Creek at west edge of Starkey Prairie. Photo Number 87346. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: T. 3 S., R. 34 E., W. M. **Size**: 3½" x 4½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of good quality; focus is sharp throughout the image. The following information is provided on the back of the hard-card on which the print is mounted – locality: Union County, Umatilla N. F., Oregon; date: 7-29-09; subject: Divide head of Fly Creek. West edge of Starky [sic] Prairie. Left centre. Slopes of Ensign Creek foreground; exposure: 2 sec.; stop: 32; light: clear; hour: 8 A. M.; direction: south; field no. 87346; col. no. "38 To 136"; relative situation: T 3 S R. 34 E. W. M.; altitude: 6000; taken by: R. E. Smith. This photograph shows a typical scene from the central Blue Mountains, with the foreground featuring a grassy area with small (three feet or less) ponderosa pine seedlings getting established. The middleground view shows more of the dry meadow environment with scattered tree seedlings. The background view shows gently undulating hills supporting mixed-conifer forests of varying density. Note that the photographer stated that this photograph pertained to the Umatilla National Forest, although if his references are correct, the area depicted in the background is now administered by the Wallowa-Whitman National Forest (La Grande Ranger District). If the reference to Ensign Creek is correct, then the legal description (township and range) may apparently be incorrect.
Keywords: Historical photograph/Union County OR/Umatilla NF/Ensign Creek/Wallowa-Whitman NF/Fly Creek.

706. **Smith, R. E. 1910**. Final report of insect control, for fall of 1910, ending November 19, 1910. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 14 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This item actually consists of three related documents: a "report of insect control for week ending October 29, 1910" (one page), a "report of insect control, for week ending November 5, 1910" (3 pages), and a document with the same title as was used for this entry (10 pages). The main document (the final report) is labeled as being from Camp Fidelity, which was the main field camp used during the control project. The camp was named after Fidelity Gulch, a tributary of Wind Creek which rises near the summit of the Elkhorn Mountains at about 7,000 feet. The control project occurred in the Wind Creek drainage. The report mentions that the weather cleared after the previous weekly report (November 5th), and the work force was quickly increased to four crews in order to burn as many of the cut trees as was possible before being snowed out completely. Piles with only logs burned fairly well, but piles with slash and logs mixed and those comprised mostly of slash were very difficult to burn, especially after they received a four-inch snowfall and some rain. However, since burning conditions were problematic in spring, and since their field work was quite heavy then, they decided to continue the fall burning even though it became expensive due to the adverse burning conditions. He mentions that a large camp can be advantageous, but that locating a camp further than two miles from an infestation should be avoided because walking a large crew any great distance becomes expensive. The plan that was used for this control project was for the officer in charge to cruise and mark the timber to be cut, and then direct or take the crews to the marked timber; the crews, which consisted of three men, would then cut, pile and burn the marked infested timber. Usually the foreman and one other man fells a tree, at which time the third man begins barking the area of the tree below the point at which they will be cut. This third man, known as the trimmer, also trims up the tops of fallen trees. After falling a group of trees, the foreman measures the infested length of each tree and records that and other data in a book – species, DBH, infested length, total length (height), and other notes. The foreman also recorded the DBH and infested length figures on the stump (this was done at the request of agents of the Bureau of Entomology, who would inspect the area later). While the foreman completed the record keeping and measurements, the other two crew members were bucking up the trees into logs and then igniting the slash and logs. At the close of each day, the foreman transferred data to the officer in charge, data which was eventually summarized to form the basis of weekly reports for the project. The Bureau's agent, Mr. Edmonston, remained at the camp throughout the project and assisted in marking timber and training new men as they reported for work. The Bureau's expert, Mr. H. E. Burke, visited Camp Fidelity during the last week of its operation and expressed his approval of the work and plans. This project found the mountain pine beetle to be quite healthy and vigorous – egg galleries were long (8 to 17 inches) and the larvae large and well developed. Very little evidence of disease or natural predators was noted. In the lodgepole pines, several species of *Tomicus* were found, often working the tops of the trees above the mountain pine beetles. In many cases, it was difficult to pick out the infested by observing pitch tubes, since tubes were not always present in aggressively-attacked trees and because of dryer than normal conditions in 1910. Bluing was noticed immediately after the trees were attacked, but only in association with mountain pine beetle; bluing did not accompany western pine beetle attacks. Bluing seemed to dry out the timber very quickly, which made the trees easier to burn. The Wind Creek watershed contains about 2,300 acres, of which 1,300 acres lies on one side of the creek and 1,000 acres on the other. In the side with 1,300 acres, infestation was found on about 300 acres, all of which was treated. In conjunction with 40 acres treated on the other side of the drainage, it was believed by Agent Edmonston that the entire 1,300 acre portion should be considered free from infestation. Since the city of Sumpter obtains its water supply from that drain-

age, the grounds were thoroughly cleaned up and all refuse either burned or buried after breaking camp. The main report ends with a 1-page table summarizing accomplishments for the fall of 1910 (statistics on number of trees cut by species; diameters, heights, and infested length summaries by species; costs; etc.).
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains/Western pine beetle.

707. **Smith, R. E. 1907**. Mistletoe *(Razoumofskya campglopoda)* in the Blue Mountains (E) National Forest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 2 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This very short report was actually an excerpt from a letter dated November 25, 1907 from R. E. Smith to Henry Ireland, Forest Supervisor of the Blue Mountains (E) National Forest. The report is shown under three topic headings: "Silvics," "Western Yellow Pine" and "Dangers and Diseases." It describes a mistletoe that grows on the branches of yellow pine and often on the bole of pine seedlings and saplings and seems to be most common in about Range 33 East (no townships given). It was also noticed in Ranges 27 and 28 East. Wherever it grows on trees, the infected part becomes enlarged and in the case of branches on large trees, the tendency is to form a cluster of small branches, gnarled and drooping (evidently a reference to mistletoe brooms). Large, badly-infected trees seem to become stunted and ripen (mature) at from 12 to 24 inches in diameter (breast high) and finally die. The author could find no other cause for their death, yet he was unable to find a sapling that had been killed by the mistletoe. A photo is mentioned, showing a specimen, that was taken on the Susanville Ranger Station. The mistletoe seeds are dispersed around the last part of September, when they are forcibly ejected from the seed pod. Seeds are coated with a semi-fluid substance that causes them to stick to whatever they touch. Smith concludes by stating that there is magnificent pine reproduction here and it is badly infected with the mistletoe, and that quite a percent of large timber is badly infected if not altogether killed by it.
Keywords: Dwarf mistletoes/Blue Mountains NF/Blue Mountains/Historical document.

708. **Smith, R. E. 1909**. South slopes of north side of Starkey Valley. Photo Number 87350. U.S. Department of Agriculture, Forest Service, Wallowa-Whitman National Forest. **Locality**: Starkey Valley. **Size**: 3½" x 4½".
Notes: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of good quality; focus is sharp throughout the image. The following information is provided on the back of the hard-card on which the print is mounted – locality: Union County, Umatilla N. F., Oregon; date: 7-30-09; subject: south slopes of north side of Starky [sic] Valley showing open prairie ridges and timbered slopes. Pure yellow pine stands. Foreground northern part of Grand [sic] Ronde proposed proposed [sic] Irrigation reservoir site. Ensign Creek. Will flood land where buildings stand; field no. 87350; col. no. "38 To 139"; taken by: R. E. Smith. This photograph shows a typical scene from the central Blue Mountains, with the foreground featuring grassy areas that appear to be heavily grazed. The middleground view shows a dense shrubland dominated by mid-height shrubs (possibly low willows). The background view shows gently undulating hills supporting mixed-conifer forests of varying density. Note that the photographer stated that this photograph pertained to the Umatilla National Forest, although if his references are correct, the area depicted in the background is now administered by the Wallowa-Whitman National Forest (La Grande Ranger District). If the reference to Ensign Creek is correct, this photo may depict the area now occupied by Indian Lake (T. 2 S., R. 34 E.).
Keywords: Historical photograph/Union County OR/Umatilla NF/Ensign Creek/Wallowa-Whitman NF/Indian Lake.

709. **Smith, R. E. Kan**. **1912**. Report of the present condition of insect infestation on the Whitman National Forest, Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 13 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The objective of this report was to provide a general idea of the effect of the 1911 insect control work completed on the Whitman National Forest, the present status of the infestation, and the increase or decrease of their natural enemies. Generally speaking, the infestation in yellow (ponderosa) pine on the treated areas was as extensive as it was at the beginning of the control operations. Since the treated areas were often bordered by untreated areas that could have contained insect broods, it was difficult to say whether the treatments were uneffective, or if the treated areas were quickly re-infested by insects from the untreated stands. It was commonly noted that new infestations came from trees located within 150 to 200 yards; often, they originated from adjoining trees which from outward signs had been infested in 1911. This indicates that at least some of the control work was carelessly done, since infested trees were missed by the control crews. While the yellow pines of all ages were "suffering" heavily, the lodgepole pine was much more numerously attacked – practically all of the lodgepole pine above six inches

DBH was infested or killed. Since the lodgepole pine had been basically destroyed by the beetles, the author speculated that had control work been effective and reasonably complete, it would have been possible to reduce insect populations to the point where natural enemies could have kept them in check. The author then notes that beetle infestations in yellow pine forests of the Grande Ronde drainage were fully as bad, in 1912, as outbreaks had been in the Powder Valley in 1909 and 1910. Smith also describes a healthy, young, vigorous, pine stand, about 20-30 years old, 10-20 feet tall, and averaging 20,000-30,000 stems per acre, where fully 25% of the trees were dead or dying from insect infestation, almost all of which he attributes to mountain pine beetle *(Dendroctonus monticolae)*. Smith presents cruise data for two sections in the Deer Creek watershed, where 32.5% of the trees were infested in 1912, and 27.5% of the trees had been cut in the 1911 control project. Smith provides the following observations regarding previous insect depradations: extensive infestations similar in extent and intensity to the present one have occurred in the lodgepole pine type; many extensive areas of long-dead lodgepole pine were actually due to pine beetle outbreaks, rather than fire as had been suspected; when beetle-killed lodgepole burns, the result can be a severe conflagration, as was demonstrated in the Ladd Creek fire of 1910 – fire severity in those instances was greater than anything ever observed in living forests lacking a high quantity of dead timber; historical infestations have been confined to the lodgepole pine type, seldom affecting yellow pine except when it occurs in mixed stands; evidence of very heavy mountain pine beetle attacks in pure yellow pine forests were lacking in Smith's examinations; outbreaks arose quickly, subsided rather quickly, and then remained at low levels until another extensive infestation took place. Smith was unsure about what caused their collapse, although he noted that climatic conditions did not seem to have an effect. He also speculates that the small size of lodgepole pine in the Blue Mountains, as compared to Montana and the Rocky Mountains, may be due to the fact that bark beetles tend to attack it as soon as the trees reach six inches in diameter. The author describes conditions in dead lodgepole pine stands as follows: "to ride through the lodgepole forests in the vicinity of Porcupine Ranger Station, T. 5 S., R. 37 E., W. M., that were infested in 1909-10 gives one the impression of an eastern hardwood forest in the dead of winter. The lodgepole all stands dead and bare, with here and there an occasional green tree of other species, such as larch, fir, etc. The earliest-attacked lodgepole is beginning to fall and it is only a matter of a short time when the great mass of it will fall." He notes that up to 50% of current year (1912) beetle broods were destroyed by natural enemies, presumably parasites and predators. Predatory and beneficial beetles and other insects were much more numerous than was observed in 1910. He had thought that ants might prey upon the adult beetles, but observations did not confirm that and the beetles' hard shell coverings were suspected of protecting them from ant bites. He noted that western pine beetle levels were normal, as were those of *Dendroctonus valens*, which attacked the base of infested trees and those that had been windthrown. Among others in a list of deductions, Smith concluded that the present infestation had reached its zenith and was beginning to decline, and that the natural enemies of mountain pine beetle had increased significantly. A map may have accompanied this report (entitled "Insect control project, northeastern Oregon, 1911" by unknown author); see the historical documents database for further information.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains/Western pine beetle.

710. **Sowder, James E. 1951**. A sanitation-salvage cutting in ponderosa pine at the Pringle Falls Experimental Forest. Research Paper No. 2. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 24 p. **Notes**: An original copy.
Abstract: Timber losses from bark beetles in the ponderosa pine forests of eastern Oregon and Washington had averaged about 600 million board feet annually after 1921. The most successful method of reducing beetle-caused timber losses was the application of sanitation-salvage cutting techniques, which were based on more than 30 years of research. This type of cutting removed those trees that are ideal breeding places for western pine beetle – trees which under normal conditions accounted for most of the annual timber losses. Removal of high risk trees reduced the risk of severe outbreaks because the ecology of the forest was changed enough to make it a less favorable place for development of high bark beetle populations.
Keywords: Ponderosa pine/Western pine beetle/Sanitation-salvage cutting/Eastern Oregon/Historical document.

711. **Spada, Benjamin**. **1960**. Estimating past diameters of several species in the ponderosa pine subregion of Oregon and Washington. Research Note Number 181. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 4 p. **Notes**: An original copy.
Abstract: In certain types of mensurational studies, an estimate of diameter outside bark is required for trees as of some previous date. This paper provides bark thickness factors and diameter-growth formulas for seven tree species commonly found in eastern Oregon and eastern Washington – Douglas-fir, ponderosa pine, lodgepole pine, white (grand) fir, subalpine fir, Engelmann spruce, and western larch.
Keywords: Ponderosa pine/Lodgepole pine/Western larch/White fir/Subalpine fir/Engelmann spruce/Bark-thick-

ness factors/Diameter-growth equations/Historical document.

712. **Spada, Benjamin**. **1962**. Forest statistics for Clallam County, Washington. Forest Survey Report 145. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 26 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1960, of Clallam County, which was initially inventoried in 1932 and 1940. The following topics were discussed: preface; Clallam County's forest resource in brief; summary tables; accuracy of the 1960 reinventory data; differences in results of inventories; forest survey procedures; definition of terms; tree species; and recent forest survey reports. Eighteen tables of statistics are included.
Keywords: Clallam County WA/Forest inventory/Historical document.

713. **Spada, Benjamin**. **1962**. Forest statistics for Jefferson County, Washington. Forest Survey Report 144. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 26 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1960, of Jefferson County, which was initially inventoried in 1932 and 1940. The following topics were discussed: preface; Jefferson County's forest resource in brief; summary tables; accuracy of the 1960 reinventory data; differences in results of inventories; forest survey procedure; definition of terms; tree species; and recent forest survey reports. Eighteen tables of statistics are included.
Keywords: Jefferson County WA/Forest inventory/Historical document.

714. **Spada, Benjamin**. **1962**. Forest statistics for King County, Washington. Forest Survey Report 143. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 27 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1960, of King County, which was initially inventoried in 1932-33 and 1941. The following topics were discussed: preface; King County's forest resource in brief; summary tables; accuracy of the 1960 reinventory data; differences in results of inventories; forest survey procedure; definition of terms; tree species; and recent forest survey reports. Eighteen tables of statistics are included.
Keywords: King County WA/Forest inventory/Historical document.

715. **Spada, Benjamin**. **1962**. Forest statistics for San Juan, Island, and Kitsap Counties, Washington. Forest Survey Report 142. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 27 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1959-60, of San Juan, Island, and Kitsap Counties, which were initially inventoried in 1932-33 and 1940. The following topics were discussed: preface; Island, Kitsap, and San Juan Counties' forest resource in brief; summary tables; accuracy of 1959 and 1960 reinventory data; differences in results of inventories; forest survey procedures; definition of terms; tree species; and recent forest survey reports. Nineteen tables of statistics are included.
Keywords: San Juan County WA/Island County WA/Kitsap County WA/Forest inventory/Historical document.

716. **Spada, Benjamin; Bones, James T. 1957**. Forest statistics for Snohomish County, Washington. Forest Survey Report No. 128. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 30 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and

the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1955, of Snohomish County, which was initially inventoried in 1932. The following topics were discussed: foreward; significant findings in the forest inventory (general, land classification, commercial forest land area, commercial forest land timber volumes, forest ownership, forest utilization); forest survey procedure; accuracy of 1955 reinventory data; differences in results of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; young growth; nonstocked cutovers and burns; noncommercial area; and nonforest). Fourteen tables of statistics are included, as are eight pie charts.
Keywords: Snohomish County WA/Forest inventory/Historical document/Mt. Baker NF/Snoqualmie NF.

717. **Spada, Benjamin; Usher, Jack H. 1955**. Forest statistics for Yakima County, Washington. Forest Survey Report No. 121. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 29 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1954, of Yakima County, which was initially inventoried in 1935. The following topics were discussed: foreward; significant findings in the forest inventory (land classification, timber volume, forest ownership, forest utilization); forest survey procedure; accuracy of reinventory data; difference in results of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (uncut sawtimber; selectively cut sawtimber; young growth; noncommercial forest area; and nonforest). Twelve tables of statistics are included, as are six pie charts.
Keywords: Yakima County WA/Forest inventory/Historical document/Snoqualmie NF/Yakima Indian Reservation.

718. **Sparhawk, W. N. 1918**. Effect of grazing upon western yellow pine reproduction in central Idaho. Bulletin No. 738. Washington, DC: U.S. Department of Agriculture. 31 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin describes the results of a study completed in 3 sheep grazing allotments on the Deadwood, Middle Fork Payette, and South Fork Payette rivers. Information was collected from the Payette NF allotments between 1912 and 1914. Tree injuries and damages are described for differing height classes, locations on the tree (bole, branches, etc.), and by cause (trampling, browsing, etc.). The extent and severity of sheep damage is compared to injuries from other causes. Recommendations about management of grazing to minimize tree damage are provided.
Keywords: Range management/Grazing damage/Idaho/Payette NF/Ponderosa pine/Historical document.

719. **Spaulding, Perley**. **1922**. Investigations of the white-pine blister rust. Bulletin No. 957. Washington, DC: U.S. Department of Agriculture. 100 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This bulletin provides a history of white pine blister rust in North America. The origin and distribution of blister rust, and its host species and life history, are described. Control measures for white pine blister rust are also provided. An extensive bibliography, including European literature, is included.
Keywords: White pine blister rust/Tree diseases/Western white pine/northern Idaho/Historical document.

720. **Spruce Budworm Control Action Committee**. **1948**. Plan for control of the spruce budworm in Oregon. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This article describes a plan for how to control an escalating outbreak of the western spruce budworm. It was prepared after a meeting was held in Portland, Oregon during late October or early November of 1948 (see an article from The Oregonian entitled “Timbermen prepare to launch program to combat ravaging spruce budworm” for more information about the meeting). As a result of the meeting, a committee of four individuals (Robert Furniss from the Bureau of Entomology; John Woods, Jr., an assistant State Forester for Oregon; A. J. Jaenicke of the U.S. Forest Service; and E. L. Kolbe of the Western Pine Association) was appointed to prepare recommendations for the U.S. Secretary of Agriculture, the Oregon State Forester, and Oregon’s Legislature regarding a proposed control strategy to combat the budworm outbreak. It is assumed that this report was one product from the Committee, which was representing the interests of the following agencies and organizations: West Coast Lumberman’s Association, Western Pine Association, Western Forestry and Conservation Association, Willamette Valley Tree

Farms, Weyerhaeuser Timber Company, Fischer Lumber Company, Oregon State Board of Forestry, U.S. Forest Service, U.S. Bureau of Land Management, U.S. Indian Service, U.S. Bureau of Entomology and Plant Quarantine, and Oregon Extension Service. The report contains the following sections: control recommendations; control considerations; description of infested areas (Eugene area, Mount Hood area, Blue Mountains area); infestation and ownership data; and plan of control and cooperation (Eugene area, Mount Hood area). It also includes two tables (Table No. 1: Summary of spruce budworm situation by intensity of infestation – season of 1948; Table No. 2: Summary of spruce budworm situation by ownership classes – season of 1948) and a hand-drawn, small-scale map showing the three primary areas of infestation (Eugene area, Mount Hood area, Blue Mountains area). The action committee recommended that control of the budworm be completed in the following order of priority: Eugene area; Mount Hood area; and Blue Mountains area (Kinzua unit, Ukiah unit, Walla Walla unit, in that order). Note that the Eugene area infestation occurred in second-growth, west-side Douglas-fir stands, whereas the Mount Hood infestation occurred on the eastern side of the Forest (east of the Cascade Crest) in mixed stands of fir and ponderosa pine. The ranking of the Blue Mountain areas was based on this rationale: the Kinzua unit was important for maintaining the timber supply in an area with timber shortages; the Ukiah area adjoined the Kinzua unit on its west side and should be treated next so that reinfestation of the Kinzua unit could be prevented; the Walla Walla unit included extensive stands of low timber value on difficult terrain. Although the committee felt that it was desirable to suppress the entire outbreak immediately, it was recognized that such an undertaking would be impractical due to technical and logistical difficulties – primarily because of time and equipment limitations. It was believed that a maximum of 200,000 acres could be sprayed during the appropriate time with the equipment and qualified operators that were available.
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Heppner RD/Mt. Hood NF/DDT/Kinzua Lumber Company.

721. **Spurr, Stephen H. 1948**. Aerial photographs in forestry. New York, NY: The Ronald Press Company. 340 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: This classic textbook contains 24 chapters grouped as an introduction and four sections – part 1: aerial photographs; part II: aerial surveying; part III: photo interpretation; and part IV: forestry applications. An index is also provided.
Keywords: Aerial photography/Forest inventory/Forest mapping/Forest measurements/Historical document/Remote sensing.

722. **Stahelin, R. 1943**. Factors influencing the natural restocking of high altitude burns by coniferous trees in the central Rocky Mountains. Ecology. 24 (1): 19-30. **Notes**: A photocopy of an original.
Abstract: This article describes a study involving eight burned areas located in Colorado and southern Wyoming, ranging in elevation between 9,000 and 11,000 feet. The following sections are included: scope of study; methods; results; environmental factors and restocking; successional development on burns located within the lodgepole pine zone; successional development on burns located outside the distribution of lodgepole pine; and summary and conclusions. Some of the conclusions were: succession after burning is influenced by whether the area is within the amplitude of lodgepole pine, aspen, or neither; when lodgepole pine was represented in the pre-burn forest, it can be expected that lodgepole pine will restock the burned area; outside the range of lodgepole pine and at lower elevations of the subalpine zone, aspen can be expected to dominate the post-burn community; sedges, grasses, rushes, and other graminoids tend to form a dense turf on high-elevation burns above the range of lodgepole pine and aspen; good restocking of burned areas was correlated with the presence of seed trees, north aspects, and *Vaccinium* as a prevalent ground cover; poor restocking was associated with a lack of seed trees, south aspects, and a predominance of graminoids as the ground cover; areas supporting ten or more seed trees per acre will be restocked within 50 years of a fire; and in aspen stands and areas with a *Vaccinium* ground cover, only 3 to 4 seed trees per acre are sufficient to ensure restocking within 50 to 100 years of a fire.
Keywords: Central Rocky Mountains/Colorado/Fire ecology/Fire effects/Forest ecology/Forest fires/Historical document/Lodgepole pine/Natural regeneration/Plant succession/Quaking aspen/Spruce-fir forests.

723. **Starker, T. J. 1916**. Defectiveness of western yellow pine, Whitman National Forest, Oregon. Annual Silvical Report. Sumpter, OR: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 7 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The reason for this study was to determine the accuracy of past timber defect deductions made during reconnaissance (inventory) examinations, and to form a basis for future defect calculations in western yellow pine forests in the Blue Mountains. Three different areas were used in this study: two on the W. H. Eccles sale and one on the areas sold to the Hilgard Lumber Company. On a portion of the first tract, the soil was shallow with much loose rock and the author believed that the poor site conditions had a direct influence on the soundness of the tim-

ber growing there. That same situation was noticed on several parts of the Baker White Pine Lumber Company timber sale area, where timber would be of good size and possessed fairly clear boles, but would be very rotten. Very little breakage was noticed on the first tract, which was not unexpected since the timber was short, of small size, and the stand was open. Defect factors recorded on the first tract included heart rot, stump rot, fire scar, crook, split and broken ends, pitch, and check and shake. The percentages of total defect by species for the first tract were 14.7% for yellow pine, 10.2% for western larch, 5.7% for Douglas-fir, and 2% for lodgepole pine. The second tract included a fairly heavy stand from which 22.35 thousand board feet per acre were harvested; total defect for all species combined averaged only 4.7%. The third tract had good-quality yellow pine and a medium to heavy stand of inferior species. The percentages of total defect by species for the third tract were 5.4% for yellow pine, 2.7% for western larch, and 3.4% for Douglas-fir. The author concluded that defect estimation was largely a matter of judgment coupled with an ability to observe certain indicators of unsoundness in a tree, such as fungus fruiting bodies, rotten limbs, spike tops, etc. Based on this study, the author believed that seldom will a mature forest of any extent in the Blue Mountains have less than 4% defect for yellow pine, nor more than 15%. One interesting result of this study was the low defect percentages for Douglas-fir and western larch; reconnaissance parties had commonly assumed a defect percentage of up to 12% for those species.
Keywords: Cutover areas/Blue Mountains/Historical document/Timber defects/Timber sales/Whitman NF/Ponderosa pine/Douglas-fir/Lodgepole pine/Western larch.

724. **Starker, T. J. 1934**. Fire resistance in the forest. Journal of Forestry. 32 (4): 462-467.
Notes: A photocopy of an original.
Abstract: This informative article discusses the fire resistance of major conifers found in the western United States. The article was based on a similar article developed by Howard Flint in 1925. It differs from Flint's article in that the coverage has been expanded to more than just the northern Rocky Mountains, with discussions added for the Pacific Northwest, northeastern United States, the Southwest, California pine region, the Southeast, and Appalachian regions. The main conclusions were that fire resistance rating is complicated due to the great variety of tree species found in the United States, and the diversity of sites on which they grow. Ratings can also be complicated by the variability associated with tree age or condition; trees of the same species can have markedly different resistance at different ages or under differing circumstances. Grand fir, for example, has very low fire resistance when young, but moderate resistance when old due to a relatively thick bark and the absence of lower crown due to self-pruning.
Keywords: Fire effects/Fire ecology/Historical document/Northern Rocky Mountains/California/Northeastern United States/Pacific Northwest/Southwestern United States/Southeastern United States/Appalachia.

725. **Starker, T. J. 1916**. Instructions for marking timber in the western yellow pine region, Pacific Northwest District. Annual Technical Report. Sumpter, OR: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 11 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: East of the Cascade Mountains in Oregon and Washington, the commercial forests consist largely of yellow pine, either in pure stands or in mixed stands with Douglas-fir, white fir, western larch, and lodgepole pine. Since these forests were primarily uneven-aged, they should be managed by the selection system (or a modification of it). [However, Starker states later in this paper that yellow pine often occurs as even-aged groups, although the forest as a whole could be classified as uneven-aged.] From the data available, it was recommended that yellow-pine and mixed forests be managed using a cutting cycle of 60 years and a rotation period of 180 years. This document, which provides general marking rules for use with yellow pine forests, consists of the following sections: general marking rules; forest floor; most desirable species; health; form of reserved trees; practically pure stands of yellow pine; mixed stands with considerable yellow pine; stands with little or no yellow pine; and conclusion. The aim of the instructions was to reserve as a basis for the next crop an evenly distributed stand of thrifty saplings, poles, and young standards, each of which is capable of living and growing until the next cutting. Since the stands had much variability, the first entry was fundamentally an improvement cut, with the objective being to leave the stand in the best possible condition for the next cutting. Starker had four criteria as to whether the forest was left in good condition: 1) will a dense cover of reproduction form quickly; 2) does the resulting forest contain as large a percentage as possible of the desirable species; 3) are the reserve trees in a good healthy condition; and 4) do the reserve trees possess good, straight trunks and thrifty, pointed crowns? Tree species desirability was ranked in this order: western yellow pine, Douglas-fir, western larch, lodgepole pine, and white fir. Starker recommended that small areas (one-half acre in size) be marked as a sample or example plot before selling the entire sale. And finally, the author recognized that timber marking involved a high degree of flexibility: "do not think that the marking must be done according to any iron-clad rules, nor that any set method must be followed. Use judgment, adapt the methods to suit conditions, but do not bankrupt the logger or ruin the forest." He also noted that "white fir in this region

is very poor and should be considered a weed. If merchantable, heavy marking should be the rule, especially on the yellow pine areas. Trees of this species over 16 inches D.B.H. are seldom sound because of the heavy attacks of Indian paint fungus which gain access to the tree through frost cracks and fire scars." This document also contains two black-and-white photographs, one showing cut-over conditions on the W. H. Eccles timber sale area, and the other a fast-growing ponderosa pine reserve tree that was left during logging. A short, one-page memorandum from the Assistant District (Regional) Forester (F. E. Ames) is also included with this paper.
Keywords: Cutover areas/Blue Mountains/Historical document/Silviculture/Selection cutting/Timber sales/Whitman NF/Ponderosa pine/Inferior tree species/Timber marking/Improvement cuttings.

726. **Starker, T. J. 1915**. Recommendations for cutting inferior species on the Whitman National Forest, Oregon. Annual Silvical Report. Sumpter, OR: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 10 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: As the national forests in the Blue Mountains began to be managed, there quickly arose a concern about how to deal with the "inferior" species, i.e., anything that wasn't yellow (ponderosa) pine. This document is the annual silvical report for the Whitman NF. It describes some options for dealing with inferior species on that Forest. Discussion and recommendations are provided for the two main situations in which inferior species were found: as a North Slope type comprised mostly of western larch and firs, and in the yellow pine areas where they occurred singly or in scattered groups. On north-slope sites, the timber sales of that era resulted in all of the yellow pine being removed, along with most of the Douglas-fir and larch. That approach resulted in lodgepole pine and grand/white fir being left. The report mentions a visit by Raphael Zon, an early ecologist with the Forest Service. Mr. Zon recommended that the Forest not touch the north slopes since they were a losing proposition commercially (the loggers claimed that they lost $3 to $4 for every thousand feet of inferior species), the post-logging stand had doubtful character and value (silviculturally), and because the north slopes had a tremendous influence on stream flow. On the areas where inferior species are intermixed with yellow pine, the author felt that they should be cut very heavily. By removing the inferior species, it would be possible for those areas to regenerate to the commercially valuable yellow pine. It was also felt that larch and fir were "out of their place" on the dryer sites supporting a high percentage of yellow pine, so their removal was desirable from a silvicultural standpoint as well. It was estimated, using experience from the W. H. Eccles and Baker White Pine Lumber Company timber sale areas, that inferior species comprised 15% of the yellow pine areas. Starker felt that no less than one third of the inferior species should be removed in a timber sale, not just for the reasons mentioned above but because they were more prone to windthrow than yellow pine. Starker also recommended that creek bottom sites be deferred from logging until the inferior species problem was solved, since those areas also contained a very high proportion of inferior species. Starker provides a table showing the percentage of volume removed on seven Whitman sales ranging from 1910 to 1913; the percentage of inferior species for those sales ranged from a low of 11.4% to a high of 31.9%, showing that inferior species were in fact being removed. The report states that the yellow pine in the central Blue Mountains was considered the best that was grown anywhere, and was advertised in the lumber trade as "Sumpter Valley Soft White Pine." It was in high demand for making patterns for iron work and would sometimes sell for $50 per thousand when purchased for that purpose. The author states that larch had very low value due to several defects and widespread infections of dwarf mistletoe. White fir was also classed as worthless due to frequent stem rot caused by Indian paint fungus. In summary, Starker recommended that the north-slope types be left alone for the time being, and that inferior species should supply at least 10% of the volume on all yellow pine sales. This report includes some interesting insights, as illustrated with this quote: "Under the present system of conducting our timber sales we are cutting all the yellow pine and most of the Douglas fir and larch on the north slopes. This leaves a majority of lodgepole pine and white fir, which soon becomes so dense that no other species can get a foothold and the resulting stand will be a very inferior jungle."
Keywords: Cutover areas/Blue Mountains/Forest economics/Historical document/Larch dwarf mistletoe/Silviculture/Selective cutting/Timber defects/Timber sales/Whitman NF/Ponderosa pine/Inferior tree species.

727. **Stauffer, Robert C. 1957**. Haeckel, Darwin, and ecology. The Quarterly Review of Biology. 32 (2): 138-144.
Notes: A photocopy of an original.
Abstract: This article provides interesting information and insights about the early development of ecology as a science or field of study. Ecology was introduced into the vocabulary of science in 1866 by a "theoretical morphologist" named Ernst Haeckel when he authored a book entitled "Generelle Morphologie." He was not a distinguished student of ecology; in fact, he was outspokenly hostile to one of the most significant ecological research efforts of his day – a controversial but influential venture to study plankton on a quantitative basis. Haeckel's views were basically his interpretation of Charles Darwin's thoughts for the German scientific community, and they were heavily influenced by Darwin's "Origin of Species" after it was published in the autumn of 1859: "to make use of the vast march onwards which the genius of Charles Darwin has effected in a biological science by his reform of

the Descent Theory and its establishment through the doctrine of selection." Haeckel's original presentation of the term "ecology" in 1866 embodies concepts the came straight from the "Origin of Species;" his contribution to the science of ecology was made in his role of academic spokesman for Charles Darwin. A major difference between the two men, however, was that Darwin appreciated the potential value of quantitative studies as a means of understanding the dynamics of ecological systems, whereas Haeckel distrusted quantitative studies and adopted a more conservative, static approach.
Keywords: Historical document/Ecology/Charles Darwin/Ernst Haeckel/Theory of evolution.

728. **Steffen, E. H. 1917**. Annual technical report: the forage acre. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, Wallowa National Forest]. 10 p.
Notes: A digital version of this report is available; filename: Wallowa4. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report specifies how forage acreages should be calculated during grazing reconnaissances of the Wallowa National Forest. A forage acre is defined as "an acre having complete ground cover (10/10 density) of palatable vegetation possible of use." The forage acre was intended to be an arbitrary measure to standardize the results obtained from grazing reconnaissances, thereby allowing the results obtained from different areas to be compared. A "forage acre factor" was calculated by multiplying the proportion of area covered by vegetation (70%), times the density of that vegetation (80%), times the palatability of the vegetation (80%). In the example above, the forage acre factor would be .448 (.7 x .8 x .8), which when multiplied by the acreage of the area being considered (80 acres), would yield a forage acre value (36 forage acres in this example).
Keywords: Historical document/Wallowa NF/Wallowa-Whitman NF/Blue Mountains/Range management.

729. **Stefferud, Alfred, editor**. **1948**. Grass: the yearbook of agriculture, 1948. Washington, D.C.: United States Department of Agriculture. 892 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: Grass can make beautiful the hillsides, schoolyards, roadsides, and farmsteads; in doing so, it brings greater utility and efficiency. Through the foods that come from it, grass can provide humankind with better health. It is an alliance with nature. It is a tool against floods and a protector of water supplies. This book provides an amazing amount of information about grass. It is organized into four parts, with one or more chapters under each part. The four parts, and their corresponding chapters, are: grass in the nation's life (a permanent agriculture; soil-grass-conservation; forage for livestock; the use and value of pastures; storage of forage; grass and rotations; the range, a major resource; enemies of grass; points to be stressed; grass for a happier living; the search for better grass; some aspects of economics); grass in the ten regions (the northeastern states; corn belt and Lake States; grasslands in the South; the northern Great Plains; the southern Great Plains; the mountain region; the Pacific Coast states; grasslands in Alaska; grasslands in Hawaii; grasslands in Puerto Rico); grass in a plant round-up (grass: green, grain, grow; the legumes of many uses; cousins and companions); and grass in charts and tables.
Keywords: Grasses/Historical document/Livestock forage/Livestock grazing/Multiple-use management/United States/Watershed protection.

730. **Sterling, E. A. 1906**. How to grow young trees for forest planting. Yearbook of Agriculture. Washington, DC: U.S. Department of Agriculture. 10 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This document is a reprint from the 1905 Yearbook of the Department of Agriculture (pages 183-192). [Note: a copy of the entire yearbook is also present in the history archives; see Hill 1906 for that accession.] The following topics are discussed: the farmer's need of a home nursery; collection, preparation, and care of seeds; the time to plant; two kinds of nursery requirements; coniferous trees; and broadleaf trees. Several drawings or photographs are also included.
Keywords: Nursery practices/Artificial regeneration/Tree planting/Historical document.

731. **Sterrett, W. D. 1915**. A. B. A. x T. B. A. (average basal area multiplied by total basal area) as a stand index factor. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 3 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: ABA x TBA was a factor that indicates the relative mathematical value of a stand from the combined standpoints of average diameter and number of trees; in other words, a stand index factor. The thinning out of small trees in a stand raised the ABA (average basal area) but lowered the TBA (total basal area). The mathematical ideal would be to cut out, in even-aged, fully-stocked stands, the small-diameter trees to a point that would result in the highest possible ABA x TBA factor, since that would create a stand with a high average diameter while leaving a large number of trees per acre, two desirable objectives from a thinning perspective. The ABA x TBA concept is illustrated by use of a table in which the trees range from 7 inches DBH to 17 inches DBH. The TBA and ABA is calculated for each tree in the table, along with the TBA x ABA factor. The author then recommends that the same

approach be used for real stands by segregating the trees into diameter classes, calculating the TBA and ABA factors for each class, and then determining the proper thinning regime by dropping off classes from the bottom (the smaller diameter classes), recomputing the ABA x TBA factor after each "drop," and then choosing the option that results in the highest ABA x TBA factor.
Keywords: Historical document/Thinning/United States/ABA x TBA stand index factor/Stand density/Density management.

732. **Sterrett, W. D. 1912**. Thinnings. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report has the following sections: terms and definitions; object of thinnings; practicability of thinnings in the United States; thinnings for different kinds of stands and species; and results – financial and silvical. At the time of this report, the term "thinning" was used in a general sense to include several different kinds of cutting operations, including improvement cutting, cleanings, preliminary thinnings, and accretion thinning. The distinction between thinnings and final cuttings was that thinnings included any cuttings in a stand before it was mature. It was necessary in the development of a forest stand for 10 to 50 times as many young seedlings to get established at its inception as there would be mature trees when the stand was ready for final harvest. Trees with desirable commodity characteristics could only develop in crowded stands where there was a struggle between individuals for light and growing space, resulting in early pruning of lower branches, development of long, clear boles, and increased height growth. Once the stand has closed (crown closure), the crowding and competition becomes unnecessarily severe and it is then time for thinning. The objective of thinning was to ameliorate overcrowding, provide the best individuals with sufficient growing space, and to bring about an even distribution of trees and a suitable stand density. In general, Sterrett believed that thinning would not be viable in the United States unless the resultant byproducts would pay for the cost of thinning, or in situations where the operation could be completed at no cost.
Keywords: Historical document/Improvement cuttings/Thinning/United States/Cleanings.

733. **Stevenson, G. E. 1936**. Report on appraisal of damages; Bowman-Hicks Lumber Company. Unpublished Typescript Memorandum. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 18 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a report and a large-format color map that was copied in sections (8½" x 11") due to the difficulty in copying over-size color materials at the National Archives. The Bowman-Hicks Lumber Company was awarded a large timber sale on June 4, 1924 that was located in the Wallowa National Forest in the general vicinity of Powwatka Ridge. The contract was extended on April 11, 1934. Under a Congressional Act of April 17, 1935, the Company made application for cancellation of its timber-sale agreement. This report describes the damages to the government resulting from cancellation of the contract. It includes the following sections: history of the sale; estimate of timber to be cut; summary; timber remaining uncut; contract cutting requirements; description of timber to be cut; accessibility of remaining timber; appraisal; conclusions of analysis; and indicated damages. When developing the sale area, the Company extended its main tap-line railroad north along the main Powwatka Ridge, approximately through the center of the sale area. Short spur lines were run off from the mainline and cutting was confined mostly to the most accessible timber. A large part of the uncut portion of the sale was partially accessed by some of the abandoned railroad grades, which could easily and cheaply be converted into truck roads. There was also an unimproved County road traversing Powwatka Ridge through the sale area and eventually leading directly into the town of Wallowa, where a Bowman-Hicks Lumber Company sawmill and a railroad shipping point were located. It was quite evident that when the remainder of the timber was cut and logged, it would have to be done with trucks and perhaps tractors. The great majority of the uncut timber was located in Township 3 North, Range 43 East. After computing its value and deducting for logging and hauling costs, the total increase in cost was $1,486.08 for 8,256 MBF of uncut ponderosa pine timber. After applying a $1200 credit for 8 miles of abandoned railroad grade that would be suitable for conversion into truck roads, and accounting for the Company's existing credit balance with the Forest Service, the final damages were assessed at $286.08.
Keywords: Blue Mountains/Historical document/Wallowa NF/Timber sales/Powwatka Ridge/Bowman-Hicks Lumber Company.

734. **Stevenson, George E. 1937**. Sale prospectus and timber appraisal report; Camas Creek Unit. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 23 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This item consists of a timber sale prospectus and a timber appraisal report for the Camas Creek unit, a timber sale containing 221,308,000 board feet of national forest timber located on the Umatilla National Forest. The sale area comprised an area of about 69,645 acres in townships 3, 4, 5, and 6 south, ranges 32, 33, 33½, and 34

east of the Willamette Meridian. It occurred in the watersheds of Camas and Meadow Creeks, with the western boundary of the unit being about 10 miles east of Ukiah, Oregon. Timber on the unit consisted of a mixed stand of ponderosa pine, Douglas-fir, western larch, lodgepole pine and other species. All of the advertised volume was ponderosa pine; cutting of the other species was optional with the purchaser. The prospectus was dated August 7, 1937; the contract would require the volume to be removed by November 30, 1955. Slash disposal for the sale was to consist of piling and burning along permanent roads, around camps, and in other areas of high hazard and on fire lines. The appraisal report indicates that the timber sale and prospectus were the result of an application by the Mt. Emily Lumber Company of La Grande, Oregon (dated March 4, 1937) that requested "the remaining National Forest saw timber within the Camas Creek Block of the Umatilla National Forest." As a result of their request, a meeting was held in Burns, Oregon on June 3rd which was attended by a representative from the Washington Office of the Forest Service (E. E. Carter), the Regional Forester of Region 6 (C. J. Buck), two other representatives from the Regional Office, and several representatives of the Mt. Emily Lumber Company. The meeting resulted in the preparation and advertising of a prospectus for a new timber sale. Calculations in the timber appraisal report show that the sustained yield for the Camas Creek Block was 13,780,000 board feet per year, and that the timber sale represented an "over-cut" of 71,100,000 for a five-year period. The Mt. Emily Lumber Company was formed principally by the Stange and Kinzel families, successful lumber operators from Wisconsin. They made heavy investments in the Grande Ronde Working Circle in 1912 and 1913. In 1925, they constructed a modern, 3-band sawmill and drying facility, along with a complete remanufacturing and fininshing plant, at La Grande, Oregon. The rated capacity of their sawmill and associated operations was 50 million board feet per year. At the time of the appraisal report, the Mt. Emily Lumber Company had been operating in the Working Circle for 8½ years, with about half of the volume coming off their own lands and the remainder from national forest lands located east of this proposed sale. They used horse teams to skid and bunch logs to truck roads except for uphill skids, which were completed using tractors. The truck roads were used to transport logs to the company's mainline logging railroad, which was then used to transport logs to Union Pacific's line at Hilgard for eventual delivery to the sawmill in La Grande. This accession also includes a color map showing the Camas Creek area, but it is unknown if it applies to this specific timber sale or to previous operations in the area. [Note that Matz's timber survey results from 1932 were used to prepare this timber sale offering; see "Descriptive report, Camas Creek timber survey project, Umatilla National Forest" in the history archives for more information. Also, it is interesting that when the sale was finally advertised in the fall of 1937, the highest bidder was not the Mt. Emily Lumber Company but the Milton Box Company of Milton, Oregon, who outbid their competitor by $0.16 per thousand board feet. That situation resulted in a storm of protest and an extremely controversial situation; see USDA Forest Service, "Miscellaneous memoranda regarding a timber sale award appeal, Camas Creek unit" for more information.]
Keywords: Blue Mountains/Historical document/Umatilla NF/Timber sales/Camas Creek/Mt. Emily Lumber Company/North Fork John Day RD.

735. **Stewart, Lowell O. 1935**. Public land surveys: history, instructions, methods. Ames, Iowa: Collegiate Press, Inc. 202 p. **Notes**: A photocopy of an original.
Abstract: This document does not include all of the original book; only pages 91 to 202 were copied. That portion of the book includes the final three chapters. They are entitled "instructions and field technique in the rectangular system of surveying; evolution of section corners; and original instructions for surveying United States public lands." It was copied to provide background information for some of the early GLO land survey notes pertaining to the Umatilla NF. In particular, chapter VIII provides reprints of the following land surveying instructions: instructions for deputy surveyors by E. Tiffin; circular from General Land Office to Surveyor General, 1831; 1836: instructions from Robert A. Lytle, Surveyor General at Cincinnati, to Wm. A. Burt, Deputy Surveyor for division into townships in Iowa; division into townships by Burt; division into townships without use of random lines; general instructions to Deputy Surveyors from the Surveyor's Office at Little Rock, Ark.; and manual of surveying instruction of 1855, General Land Office.
Keywords: General Land Office/Historical document/GLO survey notes/Land surveying.

736. **Stoddart, Laurance A.; Smith, Arthur D. 1943**. Range management. New York: McGraw-Hill Book Company. 547 p. **Size**: 6" x 9". **Notes**: An original copy of the first edition, fifth impression (printing?).
Abstract: Roughly, the 100th meridian marks the division between the area of cultivated crop production in the East and the area of range land in the West. Although timber production is an important industry, the majority of the West is too low in precipitation to support trees or supports only small trees – so the West is a land of livestock grazing. This book was written during the late 1930s and early 1940s, an era with a heightened awareness of the importance of conserving natural resources. The title of this book reflects the prevailing attitude of that era – renewable resources were meant to be used, not conserved (unused). The aim of the ranger manager was maximum use of the forage resource, so long as it was compatible with protection from permanent injury (degradation). Even

when this book was published in 1943, it was recognized that abuse of the range in many areas of the West meant that much of the range needed not only conservation, but restoration. This book includes the following chapters: the place of the range industry in the national economy; beginnings and development of the range livestock industry; development of land policies; physical features of the western United States affecting range use; grazing regions of the West; the ecology and physiology of plants in relation to grazing; nutrition in relation to range management; technical problems in range management; range surveying and management planning; importance of livestock numbers and season of grazing in range conservation; kind and breed of livestock for range grazing; livestock-management systems for range conservation; range development; artificial seeding on range lands; effects of burning upon range land; soil and water conservation on range lands; poisonous-plant problems on the range; relationship of native fauna to ranges and range use; range economics; administration and management of range lands.
Keywords: Cattle grazing/Grazing/Grazing damage/Historical document/Livestock forage/Poisonous plants/Range history/Range management/Sheep grazing.

737. **Stone, J. Herbert**. **1953**. Our access road problem on the national forests. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 5 p. **Notes**: An original copy.
Abstract: This accession consists of remarks delivered by Regional Forester Stone at the Olympic Logging Conference in Victoria, British Columbia on April 23, 1953. It begins by stating that "the management of the timber stands on the national forests of the Northwest is directed at the orderly conversion of these old-growth, virgin forests to managed stands. We seek to carry out this conversion in such a way as to provide for a sustained flow of forest products from these forests to the industries dependent upon them at as high a level as it is possible to sustain." He then goes on to explain that significant amounts of windthrow (blowdown) occurred in western Oregon in 1950 and 1951 (8 billion board feet were blown down), which was causing the timber program to shift its emphasis to salvage of timber losses caused by wind, insects, and diseases. Since much of the salvage need occurred within roadless areas, it was necessary to design and construct a transportation system, not only to implement the salvage program but to carry out the conversion of virgin forest to a managed condition. This report is interesting because of its concise description of prevailing attitudes of that era regarding forest management. It includes the following sections: nature of community dependency; main access road system a permanent investment; how should this access road system be built?; Forest Service ideas on an access road program; and access road program a business investment.
Keywords: Access management/Historical document/Forest management/Forest regulation/Pacific Northwest Region/Roads.

738. **Strickler, Gerald S. 1959**. Use of the densiometer to estimate density of forest canopy on permanent sample plots. Research Note Number 180. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 5 p. **Notes**: An original copy.
Abstract: An instrument known as the spherical densiometer has been found adaptable to permanent-plot estimates of relative canopy closure or stand density in forest and range studies. The device is more compact and simpler to use than previous ocular-type instruments. Because the instrument has a curved reflecting surface which results in observations from lateral as well as overhead positions, a problem in overlap in readings occurs when adaptation of the densiometer to permanent-plot work is attempted. Some modifications were developed to eliminate that difficulty.
Keywords: Crown closure/Spherical densiometer/Canopy cover/Forest inventory/Forest measurements/Historical document.

739. **Struble, G. R. 1937**. The fir engraver beetle, a serious enemy of white fir and red fir. Circular No. 419. Washington, DC: U.S. Department of Agriculture. 15 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular discusses the following topics: hosts and distribution of fir engraver; life history and habits of the beetle; seasonal generations; characteristics of the damage caused; host susceptibility and resistance; associated insects of secondary importance; insect enemies; and artificial control measures.
Keywords: Fir engraver/White fir/Red fir/Historical document/Insects/Insect damage.

740. **Stuart, R. V.; Norcross, T. W. 1930**. Umatilla National Forest visitor's map. Portland, OR: U.S. Department of Agriculture, Forest Service. 1:253440; Polyconic; 33" x 45"; Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a general visitor's map of the Umatilla National Forest. The base map was compiled at the Washington Office in 1922 and was based on USGS, Government Land Office, Forest Service and other surveys. The legend includes the following items: the Umatilla NF boundary, adjacent national forest bounda-

ries, exchange areas, good motor roads, poor motor roads, trails, railroads, telephone lines, the Supervisor's headquarters, Ranger stations, Guard stations, permanent lookout stations, triangulation stations, houses, cabins or other buildings, and alienated lands.
Keywords: Historical map/Maps/Umatilla NF.

741. **Sudworth, George B. 1915**. The cypress and juniper trees of the Rocky Mountain region. Bulletin No. 207. Washington, DC: U.S. Department of Agriculture. 36 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is one in a series of bulletins about tree species in the western United States. This particular accession describes the distinguishing characteristics, geographic distribution, and forest habits of all the known species of cypress *(Cupressus)* and juniper *(Juniperus)* found within the Rocky Mountain region (North and South Dakota, Montana, Idaho, Wyoming, western Nebraska, Colorado, Utah, Nevada, Arizona, New Mexico and western Texas).
Keywords: Silvics/Cypresses/Junipers/Rocky Mountains/Plant identification/Historical document.

742. **Sudworth, George B. 1900**. The forest nursery: collection of tree seeds and propagation of seedlings. Bulletin No. 29. Washington, DC: U.S. Department of Agriculture, Division of Forestry. 63 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This early bulletin includes the following chapters: introduction; collecting tree seeds and care before planting; propagation of trees from seeds and cuttings; wintering and transplanting seedlings; use of wild seedlings; and list of useful timber trees to plant. As is usually the case with Sudworth-authored documents, this bulletin includes excellent line drawings and photographs of seeds, seedlings, nurseries, and related items.
Keywords: Artificial regeneration/Seed collection/Tree planting/Nursery practices/Historical document.

743. **Sudworth, George B. 1908**. Forest trees of the Pacific slope. Unnumbered Report. Washington, DC: U.S. Department of Agriculture, Forest Service. 441 p. **Size**: 6" x 9". **Notes**: An original copy, although rebound. No bulletin or other publication series number is associated with this book.
Abstract: A classic publication. One of the earliest definitive works about the dendrology and distribution of Pacific Northwest trees. The area covered by this work includes Alaska, British Columbia, Washington, Oregon, and California. This book was intended to be the first one in a series of four that eventually would cover all native trees of North America north of Mexican border. The book was designed for use by laymen, and the use of technical terms was avoided. A total of 150 species are included in this work. The strongest feature of this book are the illustrations, many of which are full page. Some of the pen-and-ink illustrations are so finely done that they resemble photographs.
Keywords: Plant identification/Silvics/Pacific Northwest/Tree distribution/Historical document.

744. **Sudworth, George B. 1902**. Looking north down a south branch canon of McKay Creek. Photo Number 36860. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Umatilla Indian Reservation. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of high quality. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla County, Blue Mountains, Oregon; date: October 21, 1902; subject: looking north down a south branch canon of McKay Creek and over canon of McKay Creek from point 1 mile further west than 36859 and 1000 feet higher up mountain on south side of canon. Shows scattered bull pine on south sections of Indian reserve. Characteristic appearance of region along south border; species: *Pinus ponderosa*; exposure: 1½"; stop: 128; light: cloudy; hour: 2 P. M.; field no. 36860; col. no. "38 To 87"; relative situation: Umatilla Indian Reservation. N. of proposed reserve; taken by: George B. Sudworth. This photograph shows a typical scene from the northern Blue Mountains, with a tree-covered plateau visible in the far background and a series of parallel drainages in the foreground and middleground. Most of the near views are grass-dominated, although trees occur along the stream courses and in a scattered fashion on some of the upland sites. Note that it is likely that this photograph was acquired when the Blue Mountains area was being considered as a forest reserve, hence the reference in the "relative situation" portion of the photo information to a "proposed reserve."
Keywords: Historical photograph/Umatilla County OR/Umatilla Indian Reservation/Umatilla NF/McKay Creek.

745. **Sudworth, George B. 1902**. Looking north from a point near the southwest corner of the Umatilla Indian Reservation. Photo Number 36859. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Umatilla Indian Reservation. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of high quality. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla County, Blue Mountains, Oregon; date: October

21, 1902; subject: looking north from a point 10-12 miles east of the south west corner of Indian reserve, over the south slope of McKay Creek at south border of Umatilla Indian Reservation. Grassy hills; exposure: 1½"; stop: 128; light: cloudy; hour: 1:15 P. M.; field no. 36859; col. no. "38 To 86"; relative situation: N. of proposed reserve; taken by: George B. Sudworth. This photograph shows a typical scene from the foothills zone of the northern Blue Mountains, with all of the foreground, middleground, and background views dominated by gently undulating topography supporting grass-dominated vegetation types. Note that it is likely that this photograph was acquired when the Blue Mountains area was being considered as a forest reserve, hence the reference in the "relative situation" portion of the photo information to a "proposed reserve."
Keywords: Historical photograph/Umatilla County OR/Umatilla Indian Reservation/Umatilla NF/McKay Creek.

746. **Sudworth, George B. 1902**. Looking north from south bank of McKay Creek. Photo Number 36856. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Umatilla Indian Reservation. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of high quality. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla County, Blue Mountains, Oregon; date: October 21, 1902; subject: looking north from south bank of McKay Creek to the grassy hills lying along the south border of Umatilla Indian Reservation; exposure: 1½"; stop: 128; light: cloudy; hour: 10:30 A. M.; field no. 36856; col. no. "38 To 84"; relative situation: view from point 4-5 miles east from south west corner of Umatilla Indian Reservation. N. of proposed reserve; taken by: George B. Sudworth. This photograph shows a typical scene from the northern Blue Mountains, with a flat area in the foreground and middleground views and gently undulating topography in the background. The foreground is dominated by grass and some short stature sumac shrubs. It looks like the area has been heavily grazed, and several areas of exposed soil are visible (those areas appear to be part of a livestock trail). The middleground scene is dominated by a gallery forest that obviously occurs along a waterway (McKay Creek in this instance?); dominant vegetation in that area appears to be black cottonwood. The background view shows hills supporting grass; no shrubs or trees are in evidence. Note that it is likely that this photograph was acquired when the Blue Mountains area was being considered as a forest reserve, hence the reference in the "relative situation" portion of the photo information to a "proposed reserve."
Keywords: Historical photograph/Umatilla County OR/Umatilla Indian Reservation/Umatilla NF/McKay Creek.

747. **Sudworth, George B. 1902**. Looking west down the canon of McKay Creek. Photo Number 36858. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Umatilla Indian Reservation. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of moderate quality; although the focus is sharp, contrast is poor but that could be due to deterioration of the print over time. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla County, Blue Mountains, Oregon; date: October 21, 1902; subject: looking west down the canon of McKay Creek and along south border of Indian reserve, from a point 10-12 miles east of the southwest corner of Indian reserve. Scattered patches of bull pine in "draws" and gulches, black cottonwood along creek bottom; exposure: 1½"; stop: 128; light: cloudy; hour: 1 P. M.; field no. 36858; col. no. "38 To 85"; relative situation: Umatilla Indian Reservation. N. of proposed reserve; taken by: George B. Sudworth. This photograph shows a typical scene from the northern Blue Mountains, with the foreground and middleground views featuring grassy areas and a few pockets of forest or shrubland. The far middleground view shows a gallery forest dominated by black cottonwood. The background view shows hills supporting grass; although shrubs or trees are present in drainages or along the stream courses. Note that it is likely that this photograph was acquired when the Blue Mountains area was being considered as a forest reserve, hence the reference in the "relative situation" portion of the photo information to a "proposed reserve."
Keywords: Historical photograph/Umatilla County OR/Umatilla Indian Reservation/Umatilla NF/McKay Creek.

748. **Sudworth, George B. 1918**. Miscellaneous conifers of the Rocky Mountain region. Bulletin No. 680. Washington, DC: U.S. Department of Agriculture. 44 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is one in a series of bulletins describing trees of the western United States; this particular publication deals with the distinguishing characteristics, forest habits, and geographic distribution of the larch, hemlock, false-hemlock, incense cedar, arborvitae, and yew trees occurring in the Rocky Mountains. Most species descriptions are accompanied by a high quality line drawing. Range maps are provided for many species.
Keywords: Plant identification/Rocky Mountains/Silvics/Larches/Western larch/Hemlocks/Douglas-fir/Incense cedar/Western redcedar/Pacific yew/Historical document.

749. **Sudworth, George B. 1917**. The pine trees of the Rocky Mountain region. Bulletin No. 460. Washington, DC:

U.S. Department of Agriculture. 46 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This is one in a series of bulletins about tree species in the western United States. This bulletin describes the distinguishing characteristics, geographic distribution, and forest habits of all native pines *(Pinus)* found in the Rocky Mountain region. Most of the species descriptions are accompanied by excellent line drawings and range maps.
Keywords: Silvics/Pines/Rocky Mountains/Plant identification/Lodgepole pine/Ponderosa pine/Whitebark pine/ Historical document/Western white pine.

750. **Sudworth, George B. 1934**. Poplars, principal tree willows and walnuts of the Rocky Mountain region. Technical Bulletin No. 420. Washington, DC: U.S. Department of Agriculture. 111 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This is the fifth in a series of bulletins covering the tree species of the Rocky Mountains. The first four bulletins in the series covered conifers. This bulletin covers many of the important hardwood species. As was the case for earlier bulletins, this bulletin provides a range map and high quality illustration for each tree. The following topics are covered in the description of each species: common name and early history; distinguishing characteristics; occurrence and habits; and longevity. Extensive descriptions are provided for each genus, as are detailed keys to the species in the genera included in this bulletin.
Keywords: Silvics/Rocky Mountains/Plant identification/Poplars/Willows/Walnuts/Cottonwoods/Historical document.

751. **Sudworth, George B. 1916**. The spruce and balsam fir trees of the Rocky Mountain region. Bulletin No. 327. Washington, DC: U.S. Department of Agriculture. 43 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This is one in a series of bulletins about tree species in the western United States. This particular bulletin describes the distinguishing characteristics, geographic distribution, and forest habits of all known species of spruce *(Picea)* and fir *(Abies)* found in the Rocky Mountain region. It includes excellent line drawings or half-tone drawings for most of the species described.
Keywords: Silvics/Engelmann spruce/True firs/Rocky Mountains/Plant identification/White fir/Grand fir/Subalpine fir/Historical document.

752. **Sweet, C. V. 1936**. Selection of lumber for farm and home building. Farmers’ Bulletin No. 1756. Washington, DC: U.S. Department of Agriculture. 45 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in April, 1936.
Abstract: Additions and repairs to farm and home buildings are eventually needed. Wood has proven to be an economical material for that use. The efficiency derived from using wood depends on how it is selected and used. Selecting the wrong kind of wood, buying an improper grade or size, or using faulty construction methods can not only waste farm income, but the Nation’s wood resources as well. This publication is intended to help those who would like more information about the wood they buy. It includes the following sections: the lumber of today; classification of woods for principal farm and home uses; classification of woods according to important properties; lumber grades and sizes; standard lumber items usually carried in retail yards; and important points in construction and maintenance.
Keywords: Historical document/Wood characteristics/Lumber grades.

753. **Tansley, A. G. 1935**. The use and abuse of vegetational concepts and terms. Ecology. 16 (3): 284-307.
Notes: A photocopy of an original.
Abstract: This article begins “it is now generally admitted by plant ecologists, not only that vegetation is constantly undergoing various kinds of change, but that the increasing habit of concentrating attention on these changes instead of studying plant communities as if they were static entities is leading to a far deeper insight into the nature of vegetation and the parts it plays in the world.” It contains the following sections: introduction; succession; development and the quasi-organism; climaxes; “the complex organism;” the ecosystem; biotic factors; methodological value of the concepts relating to succession; conclusions; and literature cited. Much of this paper involves a discussion of autogenic and allogenic succession, development of climax plant communities, use of the term “biome” to describe ecological communities of plants and animals, and use of the term “ecosystem” to describe a broader concept than biome since an ecosystem incorporates the effects of inorganic factors of the environment.
Keywords: Historical document/Plant ecology/Climax vegetation/Forest ecology/Plant succession/Plant communities.

754. **Taylor, Charles E.; Spurr, Richard E. 1973**. Aerial photographs in the National Archives. Special List No. 25. Washington, DC: The National Archives, National Archives and Records Service, General Services Administra-

tion. 106 p. **Notes**: A photocopy of an original.
Abstract: Special lists and finding aids are published by the National Archives as part of its records description program. [Note that other special lists or finding aids are also present in the library; see Pinkett 1949 and Kelsay 1964, for example.] This special list includes aerial photographs from the Agricultural Stabilization and Conservation Service, Soil Conservation Service, Forest Service, Geological Survey, and the Bureau of Reclamation. Forest Service photographs are stored as record group 95 in the Archives. Most of the Forest Service film, taken during the period 1934-38, is of national forests of the western United States. The scale of Forest Service photography varies from 1:20,000 to 1:24,000. The list has two parts. Part 1 is an alphabetical arrangement by state, then by county, of aerial photographs in the Cartographic Archives Division. Part 2 consists of numbered entries showing the name or symbol of each survey covering more than one county, the counties covered, the number of indexes, and the scale of the photographs.
Keywords: Aerial photography/National Archives.

755. **Taylor, Walter P. 1934**. Significance of extreme or intermittent conditions in distribution of species and management of natural resources, with a restatement of Liebig's law of minimum. Ecology. 15 (4): 374-379.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article discusses the effect of unusual or intermittent environmental events on the ecology and succession of plant communities. Unusual events are quite normal; extreme environmental conditions are probably more significant in controlling plant distributions than ordinary situations. The following topics are discussed: extremes in arid areas; extremes and geographical distribution; environmental extremes and evolution; economic applications; restatement of Liebig's law of minimum; and conclusions. Liebig's law of minimum was originally stated as follows: "when a multiplicity of factors is present and only one is near the limits of toleration, this one factor will be the controlling one." Taylor proposes a restatement of Liebig's law to: "the growth and functioning of an organism is dependent upon the amount of the essential environmental factor presented to it in minimal quantity during the most critical season of the year, or during the most critical year or years of a climatic cycle."
Keywords: Historical document/Plant ecology/Liebig's law of minimum.

756. **Teesdale, L. V. 1930**. Preventing cracks in new wood floors. Leaflet No. 56. Washington, DC: U.S. Department of Agriculture. 5 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in March, 1930.
Abstract: A good wood floor is easy to keep clean, and its appearance adds to the beauty of a home's interior. A poor wood floor is unsightly, and it catches dust and dirt and creaks underfoot. This leaflet is designed to acquaint homeowners with simple safeguards to prevent cracks during construction of a building in which wood floors will be used. It contains the following sections: the cause of the cracks; cracks in the making; compression set; crooked stock; and how to prevent floor cracks.
Keywords: Historical document/Wood characteristics/Wood floors.

757. **The Oregonian**. **1948**. Timbermen prepare to launch program to combat ravaging spruce budworm. The Oregonian. November 4; Portland, OR.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This article describes the results of a timber industry meeting at which the main topic of discussion was how to finance a spray program to control an escalating outbreak of the western spruce budworm. At the time of the meeting, about 1,500,000 acres were defoliated by budworm, and 3 to 4 billion board feet of timber was threatened by the outbreak. It was estimated that a control program would cost $3,000,000, but control over the entire affected area could not occur at once since there were not a sufficient number of airplanes available and because the spraying needed to occur within a short time period designed to coincide with a particular stage of the insect's development. The largest portion of the outbreak was in the Umatilla National Forest, with lesser amounts on the Malheur, Wallowa, and Whitman National Forests. About 200,000 acres were also affected in western Oregon near Springfield, Oregon and on Mount Hood. The proposed control strategy involved spraying a chemical insecticide, called DDT, mixed in a diesel oil diluent at a rate of a pound of DDT per gallon of diesel per treated acre. The treatment needs were ranked in this order: Springfield area, Mt. Hood, Kinzua lands, and the remainder of the Blue Mountains. The eight most critical areas in the Blue Mountains – those thought to need treatment first – were all located on the Umatilla National Forest in northeast Oregon and southeast Washington. Timber on private lands owned by the Kinzua Lumber Company (their lands were adjacent to, and intermingled with, national forest lands administered by the Heppner Ranger District) were considered to represent the most critical treatment need in the Blue Mountains. The article also mentions a 5,000-acre experimental "bombing" (control project using airplanes to apply DDT) that had occurred during the previous year near Heppner, Oregon (for more information about that project, see a 1949 article from the Journal of Forestry entitled "Airplane and helicopter spraying with DDT for spruce budworm control" by C. B. Eaton and others). As a result of the meeting, a committee of four individuals (Robert

Furniss from the Bureau of Entomology; John Woods, Jr., an assistant State Forester for Oregon; A. J. Jaenicke of the U.S. Forest Service; and E. L. Kolbe of the Western Pine Association) was appointed to prepare recommendations for the U.S. Secretary of Agriculture, the Oregon State Forester, and Oregon's Legislature regarding a proposed control strategy to combat the budworm outbreak. [Note: see a report entitled "Plan for control of the spruce budworm in Oregon" (1948) by the Spruce Budworm Control Action Committee for a product from this committee.]
Keywords: Historical document/Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Heppner RD/Mt. Hood NF/DDT/Kinzua Lumber Company.

758. **Thompson, Gilbert; Johnson, A. J. 1900**. Map of the state of Oregon showing the classification of lands and forests. Washington, DC: U.S. Department of the Interior, Geological Survey. 1:1,000,000; [Projection unknown]; 29" x 23"; Colored Thematic. **Notes**: A photocopy from an original.
Abstract: This full-color map was located in the back pocket of a publication entitled "The forests of Oregon" by Henry Gannett (see Gannett 1902 for more information about the parent publication). It shows forested areas within the state of Oregon, as classified using volume per acre, and also provides ancillary information such as the location of harvested areas, burns (forest fires) and the northern limit of redwood. The following items are included in the legend: timberless area; woodland; 0 to 5,000 board feet per acre; 5,000 to 10,000 board feet per acre; 10,000 to 25,000 board feet per acre; 25,000 to 50,000 board feet per acre; 50,000 and over board feet per acre; barren; burnt; cut timber, not restocking; cut timber, restocking; and northern limit of redwood. The map was photographically copied, and copies are hanging at several locations in the Supervisor's Office. It was also digitized for the Forest's geographic information system (northeast Oregon portion only).
Keywords: Oregon/Forest mapping/Forest inventory/Forest fires/Timber harvesting/Historical map.

759. **Thompson, M. W.; Greeley, W. B. 1929**. Timber growing and cutting practice in the lodgepole pine region. Bulletin No. 1499. Washington, DC: U.S. Department of Agriculture. 33 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This is one in a series of bulletins describing forest management and logging practices used in various forest types of the United States. The management of lodgepole pine forests is discussed in this bulletin, including the following topics: the lodgepole pine region and its forest types, including associated forests of Engelmann spruce and Douglas-fir; natural and other factors affecting forest culture; measures necessary to keep forest lands productive; and preferred practices for obtaining fuller and more valuable timber crops from the lodgepole pine region.
Keywords: Lodgepole pine/Forest management/Logging operations/Spruce-fir forests/Douglas-fir/Silvicultural systems/Historical document.

760. **Tidestrom, Ivar**. **1925**. Contributions from the United States National Herbarium; flora of Utah and Nevada. Washington, DC: Smithsonian Institution, United States National Museum. 665 p. **Size**: 6" x 9".
Notes: An original copy; this was volume 25 of the National Herbarium.
Abstract: The United States National Herbarium was founded by the Smithsonian Institution. In 1868, it was transferred to the Department of Agriculture, who continued to maintain it until 1896, when it was transferred back to the Smithsonian Institution. In 1890, the Department of Agriculture instituted a series of botanical reports called "Contributions from the United States National Herbarium." The Department published the first seven volumes in that series. In 1902, based on an act of Congress, the National Museum assumed responsibility its continuance. This item, volume 25 in the series, is a flora of Utah and Nevada and that portion of Arizona lying northwest of the Colorado River. Although Tidestrom is the author, certain sections of this flora were prepared by other experts: Dr. H. L. Shantz prepared the chapter on plant ecology of deserts, whereas Dr. A. W. Sampson, formerly a range scientist with the Forest Service, prepared the chapter dealing with ecology of mountain flora. The flora was based on large specimen collections of the National Museum and the Forest Service. The number of species treated is approximately 3,700. When this work was published, many remote areas of Nevada were still imperfectly known. This book contains the following chapters: introduction; plant communities in Utah and Nevada (by Shantz); the foothill-montane-alpine flora and its environment (by Sampson); systematic treatment of the vascular plants (key to the families, annotated catalogue, additions and emendations); and an index. The frontispiece consists of a map of Utah and Nevada, showing vegetation belts (covillea belt, artemisia and pinyon belts, yellow pine belt, aspen and spruce belts, and alpine belts). There are also fifteen plates at the end of the book, consisting of black-and-white photographs taken in Spain and in various areas of Utah or Nevada.
Keywords: Botany/Historical document/Intermountain region/Nevada/Plant communities/Plant ecology/Plant identification/Utah.

761. **Tillotson, C. R. 1941**. Care and improvement of the farm woods. Farmers' Bulletin 1177. Washington, DC: U.S. Department of Agriculture. 25 p. **Size**: 6" x 9". **Notes**: An original copy. Originally issued in March, 1916 and first revised in February, 1939. This revision is dated July, 1941.
Abstract: Protection and proper cutting or "weeding" help the farm woods in the same way that they help field crops. Young trees should be coming up in openings. Such trees should be encouraged by keeping out livestock and fire and by the use of proper cutting methods. Sometimes it is necessary to plant young trees. In cutting operations, inferior kinds of trees should be cut to a smaller diameter than the more valuable trees, and all defective trees should be removed in order to improve the quality of the farm woods. Grass in the woods is a sign that the trees are not close enough together or that the woods are being mistreated. Pasturing and timber raising at the same time on the same area are mutually disadvantageous. Care and improvement of timber stands pay the farmer well. When given a little help and guidance by protection and the right use of the ax and saw, nature responds quickly in stimulated growth and also in improvement in the quality and value of the wood products.
Keywords: Farm forests/Forestry extension information/Historical document/Silviculture/Forest management.

762. **Tillotson, C. R. 1925**. Growing and planting coniferous trees on the farm. Farmers' Bulletin 1453. Washington, DC: U.S. Department of Agriculture. 37 p. **Size**: 6" x 9".
Notes: An original copy. This version is dated July, 1925.
Abstract: Coniferous trees are especially well adapted for planting on the poor waste areas common to many farms. They grow fairly rapidly and yield heavy crops of timber. They are very effective as windbreaks. Even in small sizes they may in some localities be disposed of at a profit as Christmas trees and in large sizes they have an assured market for lumber or pulp wood. This bulletin points out simple methods of collecting the seed, growing the trees in a small home nursery, planting them out in the waste places on the farm, and giving them the small amount of care subsequently desirable.
Keywords: Artificial regeneration/Farm forests/Forestry extension information/Historical document/Nursery practices/Conifer trees/Windbreaks.

763. **Tillotson, C. R. 1941**. Growing and planting hardwood seedlings on the farm. Farmers' Bulletin 1123. Washington, DC: U.S. Department of Agriculture. 28 p. **Size**: 6" x 9". **Notes**: An original copy. Originally issued in January, 1921 and initially revised in January, 1932. This revision is dated September, 1941.
Abstract: Forest trees grown on the farm add to its value and beauty. They supply material for farm use, such as poles, posts, and cordwood; they provide shelter for livestock; and they provide shelter from the heat of summer and the cold of winter. Moreover, they can often be grown on soils too poor or on slopes too steep for the successful production of typical agricultural crops. It is the purpose of this bulletin to point out simple methods that can be used to plant and care for hardwood trees on the farm, including information on how to collect seed and grow hardwood seedlings in a home garden or farm nursery. It includes the following sections: what trees to grow; planting two or more kinds of trees together; locating a plantation or windbreak; establishing a plantation; caring for a plantation; sources of planting stock; seed collection, extraction, and storage; growing the seedlings; and sources of information and advice for the planter.
Keywords: Artificial regeneration/Farm forests/Forestry extension information/Historical document/Nursery practices/Hardwood trees/Windbreaks.

764. **Tillotson, C. R. 1917**. Nursery practice on the national forests. Bulletin No. 479. Washington, DC: U.S. Department of Agriculture. 86 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This long bulletin describes early nursery operations used by the U.S. Forest Service, ranging from selection of a nursery site to shipping of mature seedlings. Seed sowing, weeding, thinning, fertilization, pest control and other nursery practices are described and illustrated.
Keywords: Nursery practices/Artificial regeneration/Historical document.

765. **Tillotson, C. R. 1917**. Reforestation on the national forests. Bulletin No. 475. Washington, DC: U.S. Department of Agriculture. 63 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes all aspects of the reforestation process, including the following topics: collection, extraction, cleaning, drying and storage of tree seed; direct seeding; sowing and outplanting of nursery seedlings; nursery stock diseases and insect pests; and selection and use of planting tools. The bulletin ends with a description of sowing and planting programs for each region of the country, with site conditions, species selection and other aspects described on a state by state basis.
Keywords: Artificial regeneration/Direct seeding/Nursery practices/Cone collection/Seed processing/Historical document.

766. **Tillotson, C. R. 1920**. Storage of coniferous tree seed. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 29 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: From 1909 to 1913, the U.S. Forest Service had an extensive reforestation program. It resulted in tree seedlings being planted or seed sown directly on large areas of deforested land. In order to complete those treatments, a large quantity of seed was required. In the year 1910 alone, 63,000 pounds of seed were collected (see a report by Henry H. Farquhar entitled "Western white pine seed collection, fall of 1911" (1912) for an interesting account of a very large western white pine cone collection project in northern Idaho in 1911). Since seed crops were sporadic and could not be counted upon to provide enough seed for large reforestation projects at the proper time, it became necessary to explore options for collecting large amounts of seed during bumper years and storing the excess for later use during lean years. This report describes a study to examine storage alternatives for conifer seed; it contains the following sections: factors affecting experiments; points of storage; conditions of storage; period covered by study; the seed testing operation; conclusions; what the study shows (effect of container, effect of temperature, effect of geographical location); and results of storage at end of ten years. Tillotson begins by describing several European studies (mostly German) that explored different ways to store conifer seed, followed by a description of the methods used in the study reported in this document. The study involved seed from six tree species, five kinds of containers, thirteen storage locations, and three temperature conditions at each of the storage locations. The species used for the test were Engelmann spruce, western white pine, lodgepole pine, ponderosa pine, eastern white pine, and Rocky Mountain Douglas-fir. The storage containers used were ordinary manila paper coin envelopes, similar envelopes soaked in melted parafin, cotton cloth bags, similar bags soaked in boiled linseed oil and then dried, and glass bottles that were sealed air-tight with parafin. Since it was unknown which geographical areas of the country would present the best climate for storing seed, thirteen areas were selected for the study: Ann Arbor, Michigan; Dundee, Illinois; Fort Bayard, New Mexico; Halsey, Nebraska; Ithaca, New York; Lake Clear Junction, New York; Lawrence, Kansas; New Haven, Connecticut; Pikes Peak, Colorado; Pocatello, Idaho; State College, Pennsylvania; Warsaw, Kentucky; and Waukegon, Illinois. The study had these results: seed storage in the air-tight containers was dramatically superior to any of the other alternatives (except for western white pine, where it was the best but not dramatically greater than the second best alternative); that a storage temperature of "indoor" (room temperature) was better than the other temperatures tested (fluctuating and low); that seed that is not stored in an air-tight container would best be stored at Fort Bayard, Pikes Peak, Pocatello, or Lake Clear Junction; and that seed stored in air-tight containers was apparently unaffected by the geographical location it was stored at.
Keywords: Seed storage/Historical document.

767. **Tipton, L. E. 1910**. Natural meadow and homestead claim on upper Fly Creek. Photo Number 81546. U.S. Department of Agriculture, Forest Service, Umatilla or Wallowa-Whitman National Forests. **Locality**: Fly Creek; T. 5 S., R. 34 E., sec. 17, W. M. **Size**: 3½" x 4½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of good quality; the focus is sharp and contrast is good. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla N. F., Union County, Oregon; date: May 18, 1910; subject: L, Whitman – Claims, Warman, Jason W., H.E. 11664, La Grande 02843, this view shows part of natural meadow in foreground and a part of fenced enclosure and buildings in center and background; exposure: snap; stop: 8; light: bright; hour: 1:50 P. M.; direction: southeast; field no. 81546; col. no. "38 Ho 91"; relative situation: T 5 S, R 34 E. W. M. Sec. 17; altitude: 4000 approximately; soil: foreground, loam, background, light; taken by: Tipton, L. E. This photograph shows a forest scene from the northern Blue Mountains, with the foreground area supporting a natural wet meadow with a thick stand of graminoids and a lone tree that appears to be a lodgepole pine. The background view shows gentle topography with a buck-and-pole fence, an open conifer stand adjoining a structure with a light-colored roof, and dense mixed-conifer forest beyond the developed area. Note that the photographer referenced this photograph as being in the Umatilla National Forest, but if his references to Union County, Oregon and the township, range and section are correct, the area depicted is now administered by the Wallowa-Whitman National Forest (La Grande Ranger District).
Keywords: Umatilla NF/Union County OR/Historical photograph/La Grande RD/Mixed-conifer forest/Homestead/Squaw Creek/Wallowa-Whitman NF.

768. **Tipton, L. E. 1910**. Part of ground which has been cleared by homestead claim. Photo Number 81547. U.S. Department of Agriculture, Forest Service, Umatilla or Wallowa-Whitman National Forests. **Locality**: Fly Creek or Squaw Creek; T. 5 S., R. 34 E., W. M. **Size**: 3½" x 4½".
Notes: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of moderate quality; although the focus is sharp, contrast is poor in the immediate foreground view but that could be due to deterioration of the print over time. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla N. F., Union

County, Oregon; date: May 18, 1910; subject: part of ground which has been cleared by claimant is here shown in foreground. Garden plot in center of picture and a part of natural meadow and south slope in background, barren slope in extreme background; field no. 81547; col. no. "38 To 131"; relative situation: T 5 S, R 34 E. W. M.; altitude: 4000; slope: south in background; taken by: Tipton, L. E. This photograph shows a forest scene from the northern Blue Mountains, with the foreground area supporting what appears to be very young lodgepole pine seedlings (2 feet or less in height) and the middleground view dominated by a buck-and-pole fenced area that has been cleared of its forest cover (the garden plot referenced in the description?). The background view shows gently sloping hills supporting a mixed-conifer forest stand. Note that the photographer referenced this photograph as being in the Umatilla National Forest, but if his references to Union County, Oregon and the township and range are correct, the area depicted is now administered by the Wallowa-Whitman National Forest (La Grande Ranger District).
Keywords: Umatilla NF/Union County OR/Historical photograph/La Grande RD/Mixed-conifer forest/Homestead/Squaw Creek/Wallowa-Whitman NF.

769. **Trappe, James M. 1957**. Experience with basal area estimation by prisms in lodgepole pine. Research Note Number 145. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 6 p. **Notes**: An original copy.
Abstract: Estimation of basal area by prisms offers intriguing possibilities for reducing time and effort in making stand inventories. Increased inventory efficiency is a particular need in stands that are relatively low in value due to small stems, a predominance of low value species, or heavy defect. In the Pacific Northwest, lodgepole pine characteristically forms dense, low-volume stands with many small stems. Consequently, during the course of a 1956 survey of lodgepole pine stands in the Blue Mountains of northeast Oregon, data were collected to compare prism estimation of basal area with a comventional plot tally by diameters. The study was made by the Blue Mountain Research Center in cooperation with the Pilot Rock Lumber Company.
Keywords: Basal area/Lodgepole pine/Forest inventory/Forest measurements/Historical document.

770. **Trappe, James M.; Harris, Robert W. 1958**. Lodgepole pine in the Blue Mountains of northeastern Oregon. Research Paper 30. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 22 p. **Notes**: An original copy.
Abstract: Lodgepole pine is a major species in northeastern Oregon. The lodgepole type covers nearly 400,000 acres in the Blue and Wallowa Mountains, and individual trees are scattered over many of the remaining six million forested acres in this area. The type blankets large areas in a region where spring floods and summer irrigation are vital factors in the economy. It also serves as a cover for game – grouse, snowshoe hares, deer, and elk. And, it is potentially important for lumber, poles, and pulpwood. All of the studied stands were found to grow only on pumicite or alluvial material overlying residual basalt soils. The most extensive pure lodgepole stands occur on broad, flat ridgetops typical of much of the Blue Mountains, and on north and east aspects. It also frequently grows along toes of steep slopes and in creek bottoms. Lodgepole pine was seldom on south aspects or steep slopes, probably because the pumicite has been largely eroded.
Keywords: Lodgepole pine/Blue Mountains/Forest ecology/Forest management/Historical document/Silvics.

771. **Trippensee, Reuben Edwin**. **1953**. Wildlife management: fur bearers, waterfowl, and fish (Volume II). New York, NY: McGraw-Hill Book Company, Inc. 572 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: The importance of managing wild lands on a sound scientific basis was becoming increasingly evident as the human population and its needs increased. After the population of the United States grew from its 150 million at the time this book was published to 200 million or more, society had no choice but conserve soil and water and to manage each acre for its greatest productivity. Fortunately, wildlife management fit well with the emerging concept of multiple use of wildland resources. Managing wildlife was a compatible multiple use not just on forested lands, but on agricultural areas as well. "Wildlife Management" was originally written as one book, but the volume of material was too great so it was split into two works; this book is the second volume and it deals with general principles of water, its conservation, and the management of swamp and marsh habitats. It includes the following sections: foundations of wildlife production (2 chapters); fur bearers (12 chapters); waterfowl (5 chapters); fish (5 chapters); general references; and index.
Keywords: Fur trapping/Game refuges/Migratory waterfowl/Wildlife management/Ducks.

772. **Trippensee, Reuben Edwin**. **1948**. Wildlife management: upland game and general principles. New York, NY: McGraw-Hill Book Company, Inc. 479 p. **Size**: 6" x 9". **Notes**: An original copy; first edition, second impression.
Abstract: The field of wildlife management was fundamentally concerned with the process of making land and water produce sustained crops of wild animals. Wildlife management had a sound economic basis because crops of wildlife could be grown on land not suited to other purposes. Wildlife could also be produced from land used for

agricultural crops, but adequate means of paying the landowner for these efforts had not yet been developed. In the decade before this book was published, much information had been gathered, and research completed, regarding wildlife and its management. The author tried to summarize that information in this accession, in which a quantitative approach to wildlife management was emphasized. "Wildlife Management" was originally written as one book, but the volume of material was too great so it was split into two works; this book is the first volume and it deals with general principles of wildlife management and the life histories, ecology, and management of upland game species. It includes the following sections: farm wildlife (6 chapters); forest wildlife (8 chapters); wilderness wildlife (10 chapters); miscellaneous wildlife relationships (5 chapters); wildlife administration (2 chapters); general references; and index.
Keywords: Big game/Elk/Deer/Game refuges/Wildlife management.

773. **Tucker, Edwin A.; Fitzpatrick, George**. **1972**. Men who matched the mountains: the Forest Service in the Southwest. Washington, DC: U.S. Department of Agriculture, Forest Service, Southwestern Region. 293 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: This interesting Regional history includes the following chapters: the pioneers; men on horseback; cattle, sheep and people; new rangers; fire!; wild times and wild horses; what the well dressed ranger should wear; six-guns and sons o' guns; grazing problems; reconnaissance; timbe-r-r-r!; no lady rangers–but lots of paper work; from horses to horseless carriages; CCC days; ranger humor; grasslands; the National Forests of Arizona; the National Forests in New Mexico; lost mines and buried treasure; ah wilderness!; recreation; multiple use; land exchanges; management; public relations; the modern ranger; and land grant country.
Keywords: Arizona/Forest history/Historical document/National forests/New Mexico/Southwestern United States.

774. **Tucker, G. J. No date**. Historical notes on early day cordwood production in the Meacham area. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 1 p.
Notes: A photocopy of an original.
Abstract: This short accession consists of a one-page report summarizing cordwood production in the vicinity of Meacham, Oregon. It begins by stating that average cordwood production was about 15,000 cords per year for the period of 1900 to 1909. The period immediately preceding that one, 1884 to 1899, was estimated to have averaged around 10,000 cords per year. For the following periods, the annual production averaged: 1910-1915, 8,000 cords; 1916-1920, 3,500 cords; and 1921-1924, 2,500 cords. Tucker also mentions that cordwood production was as high as 50,000 cords annually for a few years when electric power was generated in Pendleton using wood-fired boilers. He also recounts how cordwood was shipped from the area and the points to where it was shipped. He mentioned that most wood cutters worked alone at their job and averaged between 200 and 250 cords per year per man.
Keywords: Fuelwood/Historical document/Timber industry/Timber volume/Umatilla NF/Walla Walla RD/Meacham OR/Cordwood.

775. **Tucker, Gerald J. 1940**. History of the northern Blue Mountains. Unpublished Report. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Umatilla National Forest. 170 p.
Notes: A photocopy of an original.
Abstract: Provides a prehistory and history for the northern Blue Mountains, primarily that portion located in southeastern Washington (Columbia, Garfield, and Asotin counties, Washington). The following subjects are covered: geology of the northern Blue Mountains, the coming of Lewis and Clark, the Nez Perce and Captain B.L.E. Bonneville, early Indian trails, the Treaty of 1855, early pioneer accounts, early Garfield County history, pioneer history of Columbia Center, pioneer history of the Alpowa region, pioneer history of the Asotin sections, pioneer history of the Anatone section, pioneer history of the Clarkston section, pioneer Eden and Grouse Flat history, the beginning of the livestock industry in the Blue Mountains, history of the livestock industry in the national forest area of the northern Blues, wildlife ups and downs, roads of the northern Blues, timber cuttings in the northern Blues, forest fires of the northern Blues, Forest Service improvements in the northern Blues, and Forest Service personnel of the northern Blues.
Keywords: Forest history/Historical document/Blue Mountains/Umatilla NF/Columbia County WA/Asotin County WA/Garfield County WA/Range management/Forest management/Wildlife management/Access management/Forest fires.

776. **Twerdal, M. P.; MacLean, C. D. 1957**. Forest statistics for Tillamook County, Oregon. Forest Survey Report No. 130. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 34 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present con-

sumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1955, of Tillamook County, which was initially inventoried in 1930. The following topics were discussed: preface; description of the county; significant findings in the forest inventory (land classification, commercial forest land area, commercial forest land timber volumes, forest ownership, forest utilization); summary tables; forest survey procedure; accuracy of 1955 reinventory data; differences in results of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; young growth; nonstocked burns and cutovers; and nonforest land). Thirteen tables of statistics are included, as are nine pie charts.
Keywords: Tillamook County OR/Forest inventory/Historical document/Siuslaw NF.

777. **Twerdal, Melvin P.; Minore, Don**. **1955**. Forest statistics for Thurston County, Washington. Forest Survey Report No. 123. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 27 p. **Notes**: An original copy.
Abstract: The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products, and to analyze and make available information needed for the formulation of forest policies and programs. This report summarizes the results of a reinventory, in 1954, of Thurston County, which was initially inventoried in 1932. The following topics were discussed: foreward; significant findings in the forest inventory (land classification, commercial forest land areas, commercial forest land timber volumes, forest ownership, forest utilization); forest survey procedure; accuracy of reinventory data; difference in results of inventories; and definition of terms used. A map shows the location and distribution of forest stand-size and condition classes in the county (sawtimber; young growth; nonstocked burns; and nonforest land). Twelve tables of statistics are included, as are eight pie charts.
Keywords: Thurston County WA/Forest inventory/Historical document.

778. **U.S. Department of Agriculture, Bureau of Entomology**. **1927**. The relation of insects to slash disposal. Department Circular 411. Washington, DC: U.S. Department of Agriculture. 12 p. **Size**: 6” x 9”.
Notes: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This circular discusses the following topics: slash as a factor in forest protection; few species of trees are hosts of slash-breeding insects; insects associated with pine slash (white pine, red pine, western white pine, sugar pine, ponderosa pine, jeffrey pine, lodgepole pine, monterey pine, and the southern pines); insects associated with spruce slash (spruce in the northeast and great lakes regions, Engelmann spruce in the Rockies); and insects associated with Douglas-fir slash.
Keywords: Slash/Slash treatment/Insects/Western white pine/Ponderosa pine/Lodgepole pine/Engelmann spruce/Douglas-fir/Historical document.

779. **U.S. Department of Agriculture, Bureau of Forestry**. **1902?** Damage by recent forest fires. Press Bulletin No. 24. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. 1 p. **Size**: 8.5” x 14”.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short press bulletin has no date, but it is believed to have been issued late in 1902 or early in 1903. It describes the losses associated with a huge forest fire that burned in northwestern Oregon and southwestern Washington during a dry September. The fire is typically referred to as the Yacolt Burn, which climaxed on September 17, 1902 and affected 700,000 acres and caused a large loss of life. Fully 170,000 acres were burned over in Multnomah and Clackamas Counties, Oregon. In Washington, the losses were more severe, with 434,000 acres affected in Skamania, Cowlitz, and Clarke Counties. The press release enumerates the losses associated with the fires, including losses of farm property, timber stumpage, and public improvements such as schools, churches, and bridges. A singular chain of circumstances combined to make the fires so destructive. Not only was the summer very dry, but the two preceding summers were wet in May and June, thus interfering with slash burning and allowing an unusually high amount of logging debris to accumulate. In the early part of September, the wind blew from the east most of the time, which rapidly dried out the forest and its fuels. The fires were believed to have started from the unextinguished campfires of berry pickers and hunters, from careless slash burning, from locomotive sparks, and from other human causes. There was little or no damage in the Cascade Forest Reserve, which the author believed was due to the regular forest patrols in that area.
Keywords: Cowlitz County WA/Forest fires/Historical document/Clackamas County OR/Skamania County WA/Clarke County WA/Northwestern Oregon/Southwestern Washington.

780. **U.S. Department of Agriculture, Bureau of Forestry**. **1903?** How to pack and ship young forest trees. Forest Planting Leaflet No. 2. Washington, DC: U.S. Department of Agriculture, Bureau of Forestry. 2 p. **Size**: 6” x 9”.

Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This short leaflet describes how to pack and ship young trees (wildlings or transplants). Considerations for both coniferous and deciduous species are discussed.
Keywords: Artificial regeneration/Tree planting/Historical document.

781. **U.S. Department of Agriculture, Bureau of Forestry**. **1905**. Terms used in forestry and logging. Bulletin No. 61. Washington, DC: U.S. Department of Agriculture, Bureau of Forestry. 53 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This document, which was prepared in cooperation with the Society of American Foresters, is believed to represent one of the first attempts to develop a standardized forestry terminology for the United States. Definitions and synonyms are provided for each included term.
Keywords: Historical document/Forestry terminology.

782. **U.S. Department of Agriculture, Bureau of Forestry**. **1904**. The Wenaha Forest Reserve, Washington and Oregon. [Place of publication unknown]: U.S. Department of Agriculture, Bureau of Forestry. [1:126720]; [Projection unknown]; 27" x 36"; Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of an early base map for the Wenaha Forest Reserve. Starting in 1907, the area covered by this map was known as the Wenaha National Forest. The Wenaha National Forest was eventually combined with the Umatilla National Forest to the south in November of 1920. The current Umatilla NF Ranger Districts of Pomeroy and Walla Walla were originally contained within the Wenaha NF. There is no information on the map other than a title, publisher, north arrow, and date; no legend, projection or compilation information is included. It is interesting that at the time this map was published, there was very little survey information available – almost all of the townships north of Township 4 North were shown as unsurveyed.
Keywords: Historical map/Maps/Umatilla NF/Wenaha NF/Walla Walla RD/Pomeroy RD.

783. **U.S. Department of Agriculture, Bureau of Plant Industry**. **1922**. White-pine blister rust in the western United States. Circular 226. Washington, DC: U.S. Department of Agriculture. 7 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This circular was designed to acquaint the public (laymen) with white pine blister rust, including a discussion of the following topics: what it is; how it spreads; what you should do about it; and the values at stake.
Keywords: White pine blister rust/Western white pine/Forestry extension information/Historical document.

784. **U.S. Department of Agriculture, Forest Service**. **1955**. Annual accomplishment reports, progress of timber management, fiscal years 1950-1954. Unpublished Processed Forms. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. Variable p. **Notes**: An original copy.
Abstract: This accession consists of a collection of processed forms that summarize timber harvest levels by working circle, Ranger District, and timber sale. It includes forms for fiscal year 1950 through fiscal year 1954, and for a variety of working circles and timber sales. Most of the information is supplied on "Annual Accomplishment Report Progress of Timber Management" forms (R6-S310). The "budget" information (volume available for cutting, and timber drain or harvest) was summarized on "Forest Summary of Management Plan Budget Report" forms (R6-S311). Miscellaneous memoranda from the Regional Office that relate to timber management planning and record keeping requirements ("Regional Summary, Progress of Timber Management, Calendar Year 1954", etc.), and miscellaneous tables summarizing information from timber management plans, are also included in this accession.
Keywords: Historical document/Timber harvesting/Timber sales/Umatilla NF.

785. **U.S. Department of Agriculture, Forest Service**. **1962**. Annual accomplishment reports, progress of timber management, fiscal years 1955-1961. Unpublished Processed Forms. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. Variable p. **Notes**: An original copy.
Abstract: This accession consists of a collection of processed forms that summarize timber harvest levels by working circle, Ranger District, and timber sale. It includes forms for fiscal year 1955 through fiscal year 1961, summarizing information for two working circles (South Umatilla and North Umatilla) and for individual timber sales. Most of the information is supplied on "Annual Accomplishment Report Progress of Timber Management" forms (R6-S310) and "Individual Sale Status and Progress" forms (R6-2410-310). Miscellaneous memoranda from the Regional Office that relate to timber management planning and record keeping requirements ("Regional Summary, Progress of Timber Management, Calendar Year 1955", etc.), and miscellaneous tables summarizing information from timber management plans, are also included in this accession.

Keywords: Historical document/Timber harvesting/Timber sales/Umatilla NF/North Umatilla Working Circle/ South Umatilla Working Circle.

786. **U.S. Department of Agriculture, Forest Service**. **1961**. Annual accomplishment reports, progress of timber management, fiscal years 1955-1960. Unpublished Processed Forms. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. Variable p. **Notes**: An original copy.
Abstract: This accession consists of a collection of processed forms that summarize timber harvest levels by working circle, Ranger District, and timber sale. It includes forms for fiscal year 1955 through fiscal year 1960, summarizing information by working circle (Heppner, Pendleton-Pilot Rock, Grande Ronde, Walla Walla, Clearwater; South and North Umatilla for later years) and for individual timber sales. Most of the information is supplied on "Annual Accomplishment Report Progress of Timber Management" forms (R6-S310) and "Individual Sale Status and Progress" forms (R6-2410-310). Miscellaneous memoranda from the Regional Office that relate to timber management planning and record keeping requirements, and miscellaneous tables summarizing information from timber management plans, are also included in this accession.
Keywords: Historical document/Timber harvesting/Timber sales/Umatilla NF/North Umatilla Working Circle/ South Umatilla Working Circle.

787. **U.S. Department of Agriculture, Forest Service**. **1952?** Annual cutting records for the Umatilla National Forest – Working Circles. Unpublished Processed Forms. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 5 p. **Size**: 18" x 21". **Notes**: An original copy.
Abstract: This accession consists of five over-sized forms that were used to monitor timber harvest volumes on the Umatilla National Forest. The forms were set up to track harvest volume by species ("ponderosa pine" and "other species"), fiscal year, working circle, and block. Volumes were recorded by hand on the form as "annual cut in thousand board feet." Each form was pre-printed with the names of 6 Umatilla NF working circles and each block that occurred within a working circle. Working circles and their blocks were: Clearwater working circle (Pomeroy, Asotin blocks); Walla Walla working circle (Dayton, Walla Walla, Milton blocks); Grande Ronde working circle (Wenatchee, Wenaha, Elbow blocks); La Grande working circle (Elgin, Five Points, West Starkey, East Starkey, Ladd Canyon, Grossman, Rondowa, Cove, Catherine Creek blocks); Pendleton–Pilot Rock working circle (Gibbon, McKay Creek, Pilot Rock, Gurdane, Ukiah, Camas, North Fork, Desolation blocks); and Heppner working circle (Fossil, Lonerock, Service Creek, Winlock, Rock Creek, Spray, Wall Creek, Willow Creek, Ditch Creek, Potamus blocks). Each of these sheets pertained to the Pendleton (Meacham) Ranger District, which was eventually combined with the Walla Walla Ranger District in the late 1970s. The forms in this accession were found in a timber atlas that had been maintained by the Pendleton Ranger District; the atlas was found at the Forest Service compound on Byers Avenue in Pendleton. The dates included on these sheets ranged from 1937 to 1952; two of the sheets summarized harvest volumes for National Forest lands, whereas another two covered private and other lands. The fifth sheet summarized harvest volumes for the McKay and Five Points blocks on the Meacham portion of the Pendleton Ranger District (1942-1947), with the volumes categorized by Forest Service sawtimber sales, Forest Service small sales for other products, and convertible timber products from private land.
Keywords: Clearwater Working Circle/Heppner Working Circle/Grande Ronde Working Circle/Historical document/Pendleton-Pilot Rock Working Circle/Timber harvesting/Timber sales/Walla Walla Block/La Grande Working Circle/Walla Walla Working Circle/Pendleton RD.

788. **U.S. Department of Agriculture, Forest Service**. **1975**. Answers to public concerns about DDT and the tussock moth. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 9 p. **Notes**: An original copy.
Abstract: This accession consists of a series of questions and answers. It apparently was prepared to address public concerns about use of DDT to control a Douglas-fir tussock moth (DFTM) outbreak that had affected almost 800,000 acres in Oregon and Washington by 1973. As a result of escalating tree mortality, a DFTM control project was completed in 1974, when 455,000 acres were sprayed with DDT. Many other possible insecticides had been tested (Dylox, Sevin 4-Oil, Zectran, Bioethanomethrin, *Bacillus thuringiensis* (a microbial agent), and nucleopolyhedrosis virus), but none had proved effective on an operational basis. This report includes answers to 12 "current" questions (why was the 1974 spray program using DDT carried out?; what plans are being made for control of the Montana outbreak?, etc.), along with answers to an additional 8 "other background" questions (what is the tussock moth and what does it do to the forests?; what causes the collapse of outbreaks?; etc.).
Keywords: DDT/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/Oregon/Washington/ Chemical insecticides/Bacillus thuringiensis/Zectran.

789. **U.S. Department of Agriculture, Forest Service**. **1923**. Arbor day. Circular 265. Washington, DC: U.S. Depart-

ment of Agriculture. 15 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This publication traces the history and meaning of Arbor Day, as discussed in the following topics: the meaning of Arbor Day; origin of Arbor Day; spread and observance of Arbor Day; dates of Arbor Day observance; Arbor Day and the spirit of civic betterment; care of trees; planting of trees along roads and highways; woods and water supply; memorial trees; trees to plant (recommended species for different areas of the country); and planting suggestions.
Keywords: Arbor Day/Community development/Forestry extension information/Historical document.

790. **U.S. Department of Agriculture, Forest Service**. **1911**. Area of lodgepole pine in District 6. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 1 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is a short extract from a letter dated November 22, 1911 to the Forester in Washington, DC from the District (Regional) Forester. The memo had a file designation of SS, Tree Studies, Lodgepole Pine. The District Forester’s estimate of the proportion of each national forest in the District that was covered with stands of lodgepole pine, as based on extensive reconnaissance maps and on information furnished by field officers, was provided in a table. The proportions for forests in the Blue Mountains was: Wenaha NF – 15%; Wallowa NF (including Minam NF) – 25%; Umatilla NF – 25%; Whitman NF – 20%; and Malheur NF – 10%.
Keywords: Blue Mountains/Forest inventory/Historical document/Lodgepole pine/Malheur NF/Minam NF/Umatilla NF/Wallowa NF/Wenaha NF/Whitman NF/Pacific Northwest Region.

791. **U.S. Department of Agriculture, Forest Service**. **1966**. Blister rust control handbook. R-6 Handbook 5277. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p.
Notes: An original copy. Issued in May, 1966.
Abstract: This is a standard Forest Service Handbook issued by the Pacific Northwest Region. It contains the following chapters: life cycle, control and history; and *Ribes* ecology and descriptions. The handbook was originally intended to include 9 chapters, but the last 7 were never written. Chapter 20 includes good descriptions of the major *Ribes* species in the Pacific Northwest, including high-quality line drawings showing their foliage and fruits. The last part of chapter 20 also includes a key to the *Ribes* species.
Keywords: Disease surveys/Pacific Northwest Region/Plant identification/Tree diseases/White pine blister rust/Ribes.

792. **U.S. Department of Agriculture, Forest Service**. **[Date unknown]**. Brief historical survey of American agriculture, 1860-1921. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 8 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This paper provides a short history of agricultural development in the United States. It describes how lands came into the public domain, and how those lands were disposed of after the Civil War. In particular, the Homestead Act of 1862 reflected an official government policy of rapid disposition of those lands, which aggregated over one billion acres in 1860. At the same time, the states and other entities that had received large land grants were offering them for sale at reasonably low prices. By the close of the 19th century, most of the free and cheap lands of the Nation had been taken. As of 1904, 54 percent of the public domain had been successfully transferred to private ownership, and most of what remained was non-agricultural land located in the mountainous and semi-arid regions of the western United States. Fertile and cheap land in the Midwest and far West attracted not only settlers from the Eastern seaboard, but also much of the immigrant population from Europe. The rapid expansion of agriculture in the early twentieth century was also aided by development of labor-saving machinery, especially in the flat areas of the Midwest. Development of railroads and other transportation systems allowed farmers to get their products to market quickly. Perhaps the greatest factor affecting agricultural development was an increasing trend toward urbanization. In 1860, the urban population stood at 16%; by 1900, it had risen to 40%. Large population concentrations in urban centers, most of which could be easily supplied by cheap transportation from distant agricultural regions, created important economic and societal changes. As a result of those circumstances, the United States began producing food stuffs that were far beyond its own needs and eventually became the largest surplus producing country in the world. In the late 1860s, 21 million bushels of wheat or 10% of the entire crop was exported; by the late 1890s, 189 million bushels or 31% of the crop was being exported each year. During most of that period, an extensive type of agriculture predominated, one derived from land that was free or cheap. This caused a tendency to cultivate the maximum acreage per individual, often resulting in a single-crop system that didn’t necessarily produce high yields per acre, but did result in the highest returns per individual farmer. As agriculture shifted from the East to the Midwest and far West, other changes naturally followed. As total production increased, the price of wheat fell, causing it to be abandoned by eastern farmers. Corn moved from the East to the

Midwest, where it was ideally suited. Hogs followed the corn. Sheep in New England were moved to cheaper pasturage in the far West, having been displaced by more lucrative dairy cows in New England. By the end of the first World War, further agricultural shifts were occurring. Total production had fallen, along with the proportion available for export. South America, Australia, India, Canada, and other regions were beginning to export food stuffs to America, successfully competing with high internal transportation costs from the Mississippi Valley to the Atlantic seaboard. Some of these changes reflected a lack of new, virgin land, which caused farmers to use their existing land more intensively and to adopt better farming practices such as crop rotation, abandonment of low-yield areas, application of fertilizers, etc.
Keywords: Agriculture/Historical document/United States.

793. **U.S. Department of Agriculture, Forest Service**. **1917**. Commercial timber land on national forest lands of District 6, by counties and species. Unpublished Typescript Memorandum. [Portland, OR]: U.S. Department of Agriculture, Forest Service, District 6. 10 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: According to typed annotations on the top, this long, ten-page table was included with a letter dated November 5, 1917. The letter was not available and is not included with the table. The table is dated November 5, 1917 and has a file designation of S, Timber Surveys, Estimates. It provides an estimate of the total timber volumes, in millions of board feet, for each of the commercial tree species that occur on national forest lands in a particular county. The first four and a half pages includes information for Washington counties; the next five pages includes data for Oregon counties; the bottom of page 9 provides a summary for two California counties; and page ten summarizes timber volumes for all of Alaska.
Keywords: Historical document/Timber volume/Alaska/California/Oregon/Washington.

794. **U.S. Department of Agriculture, Forest Service**. **1968**. Compartment examination. Compartment Prescription Handbook, FSH 2411.14, Chapter 10, Umatilla Supplement No. 1. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Umatilla National Forest. 46 p. **Size:** 5” x 8”.
Notes: An original copy (2).
Abstract: This handbook supplemented Region 6 direction by establishing local direction for compartment examination on the Umatilla National Forest. It includes the following sections: introduction (TSI compartment examination, compartment examination objectives, compartment boundary establishment, TSI compartment examination procedures, type mapping, priority of examination, preparation for examination, and route of travel); field procedures (calculating the number of samples needed, TSI compartment examination form, explanation of items on the field form); and office procedures (calculating number of trees per acre and basal area per acre, explanation of summary TSI data items).
Keywords: Forest inventory/Forest measurements/Historical document/Tree measurements/Timber compartments/Umatilla NF.

795. **U.S. Department of Agriculture, Forest Service**. **1967**. Compartment examination guide. Unnumbered Handbook. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Okanogan National Forest. 34 p. **Size**: 5” x 8”. **Notes**: An original copy.
Abstract: This handbook apparently supplemented Region 6 direction by establishing local direction for compartment examination on the Okanogan National Forest. It includes the following sections: introduction; field procedures (statistical determination of number of plots, the compartment examination field form); office procedures; and appendix material (site index table, gross VBAR tables, and percentage distribution of total tree volume by 16-foot logs).
Keywords: Forest inventory/Forest measurements/Historical document/Tree measurements/Timber compartments/Okanogan NF.

796. **U.S. Department of Agriculture, Forest Service**. **1964**. Compartment examination instructions, East Side. Timber Management Planning Handbook, 2413.11a, Chapter 7. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. 22 p. **Size**: 5” x 8”.
Notes: An original copy (3).
Abstract: This handbook establishes compartmentation and compartment examination procedures for the East Side of Region 6. It includes the following sections: establishment of compartments; data to be made available through compartment examination; type mapping; data specifications; explanation of the tally sheet; field equipment for compartment examination; and one table (trees per acre for sample taken).
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Tree measurements/Timber compartments.

797. **U.S. Department of Agriculture, Forest Service**. **1978?** DFTM chronological sequence of events. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 3 p. **Notes**: An original copy.
Abstract: This item consists of a 3-page chronology of the Douglas-fir tussock moth (DFTM) outbreak that affected the northern Blue Mountains in the early 1970s. It begins with this entry: "1971 – Defoliation on 2400 acres in Okanogan Valley, Washington" and ends with this one: "Sept. 30, 1978 – DFTM R&D Program terminated." In between is detailed information about establishment of impact-assessment plots on areas affected by DFTM; selling of salvage sales related to DFTM-caused tree mortality; research conducted on the effects of DDT which was used as an insecticide against DFTM; testing of virus and B.t. as insecticides; USDA's petitions to the Environmental Protection Agency for permission to use DDT against DFTM; and summary figures showing how much area was finally treated in June and July of 1974 in response to the DFTM outbreak. The summary chart shows that 799,460 acres were defoliated (353,850 on the Umatilla NF), of which 480,460 was proposed for treatment (87,657 on the Umatilla NF) and 426,559 actually treated with DDT (32,706 on the Umatilla NF).
Keywords: Blue Mountains/DDT/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/ Timber salvage/Umatilla NF/Chemical insecticides/Zectran/Bacillus thuringiensis.

798. **U.S. Department of Agriculture, Forest Service**. **1911**. District Forester's Annual Report, Fiscal Year 1911, District 6. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service, District Office]. 63 p.
Notes: A digital version of this report is available; filename: 1911Rep1. Photocopy from an original located at the Pacific NW Region of the National Archives in Seattle, WA.
Abstract: This report covers the following topics for all of District (Region) 6: claims and settlement; law enforcement; executive force; forest management; losses by forest fires; reforestation; stream flow studies; range management; range conditions; use of private lands; game preserves; studies of forest products; and silviculture.
Keywords: Historical document/Program administration/Oregon/Washington/Pacific Northwest Region.

799. **U.S. Department of Agriculture, Forest Service**. **1972**. Douglas-fir tussock moth situation. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 18 p.
Notes: An original copy.
Abstract: This accession consists of two items: a 2-page memorandum with a 5200 file designation, and a 16-page fact sheet that was prepared in October 1972 and revised on November 8, 1972. The memorandum states that the Douglas-fir tussock moth (DFTM) outbreak covered over 500,000 acres as of 1972 and that considerable additional damage was expected in following years. Due to public concerns about the DFTM outbreak, a long fact sheet was developed and a copy of it attached to the memorandum. The memo also states that there was no registered insecticide available for control of DFTM, and that DDT was the only substance that had been successfully used against it in the past but that all federal forest uses of that material had been recently cancelled or suspended. It was mentioned that Zectran and pyrethrins had been tested during 1972 as insecticides for DFTM (testing occurred in Okanogan County, Washington and Union County, Oregon), but that results had been inconclusive. Of the two materials, Zectran was most promising and additional testing of it was planned for 1973. The detailed fact sheet includes the following sections: resume; the insect; the damage; natural control; chemical control; the current outbreaks (1971, 1972); 1972 insecticide tests; and references. In addition, the fact sheet includes the following tables: Douglas-fir tussock moth infested areas; total infested acres in La Grande and Walla Walla units; summary of Douglas-fir tussock moth infestations in roaded areas; and summary of Douglas-fir tussock moth infestations in undeveloped roadless areas 5,000 acres and larger. A small-scale map is the last page of the fact sheet; it shows western spruce budworm outbreaks and Douglas-fir tussock moth outbreaks in Region 6 of the Forest Service.
Keywords: Blue Mountains/DDT/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/ Zectran/Okanogan County WA/Union County OR/Umatilla NF/Chemical insecticides/Bacillus thuringiensis/ Roadless areas/Western spruce budworm.

800. **U.S. Department of Agriculture, Forest Service**. **1939**. Dual-purpose pines. Leaflet No. 168. Washington, DC: U.S. Department of Agriculture, Forest Service, State and Private Forestry. 8 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: Most trees serve mankind in more than one way. This bulletin provides information about 2 species of "dual-purpose" pines: longleaf and slash pines. These pines are valuable because they can yield two cash crops for the southern farmer: naval stores (turpentine, etc.) and wood. Guidance about managing slash and longleaf pines is provided for the following topics: fire protection, diversified timber farming, early thinnings, starting a new stand, good turpentining practices, harvesting wood products, marketing of crude gum by farmers, and a description of conservation programs offered by the U.S. Department of Agriculture.
Keywords: Historical document/Longleaf pine/Timber management/Turpentine production/Slash pine/Naval

stores.

801. **U.S. Department of Agriculture, Forest Service**. **1922**. Estimated stand of national forest timber. Unpublished Typescript Report. Washington, DC: U.S. Department of Agriculture, Forest Service. 3 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is a 3-page table summarizing timber volumes on the national forest system as of June 30, 1922. The first two pages summarize saw timber (in MBF) and cordwood (in cords) volumes by national forest, arranged by District (Region). For Forests in the Blue Mountains, the volumes were: Malheur NF, 6,560,000 MBF; Umatilla NF, 4,528,795 MBF; Wallowa NF, 1,800,130 MBF; and Whitman NF, 5,864,758 MBF. A small table on the second page summarizes timber volume by State. A table on the last page summarizes volumes by tree species, with subtotals provided for each District (Region). The two species with the highest volumes were Douglas-fir (142,565,945 MBF) and western yellow pine (105,190,733 MBF).
Keywords: Historical document/Malheur NF/Timber volume/Whitman NF/Umatilla NF/Wallowa NF/Pacific Northwest Region.

802. **U.S. Department of Agriculture, Forest Service**. **1969**. Field instructions for integrated forest survey and timber management inventories in Oregon, Washington, and California. Unnumbered Handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Forest Survey Research Work Unit. Irregular p. **Notes:** An original copy.
Abstract: This comprehensive field manual was designed to spell out the instructions, definitions, procedures, and classifications to be used by Region 6 when conducting timber resource inventories in Oregon and Washington. Instructions are organized in two parts: the first part covers the procedures for locating, establishing and measuring new 10-point variable-radius sample plots; the second part covers the procedures to be used for relocating and remeasuring previously-established fixed-radius plots. The handbook contains the following sections: purpose; objectives; survey design; description of the plot; quality control; and procedures for 10-point sample measurements (locating the plot on the ground, referencing and establishing plot center, land classification, definitions of land use classes, referencing and marking sample points, and site trees). Two tatum aids are also included with this copy.
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Tree measurements.

803. **U.S. Department of Agriculture, Forest Service**. **1968**. Field instructions for integrated forest survey and timber management inventories in Oregon, Washington, and California. Unnumbered Handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Forest Survey Project. Irregular p. **Notes**: An original copy.
Abstract: This comprehensive field manual was designed to spell out the instructions, definitions, procedures, and classifications to be used by Region 6 when conducting timber resource inventories in Oregon and Washington. Instructions are organized in two parts: the first part covers the procedures for locating, establishing and measuring new 10-point variable-radius sample plots; the second part covers the procedures to be used for relocating and remeasuring previously-established fixed-radius plots. The handbook contains the following sections: purpose; objectives; survey design; description of the plot; field plot procedures; field organization; quality control; and procedures for field sample measurements – new 10-point plots (locating the plot on the ground, plot reference data, definitions of land use classes, and referencing and marking sample points).
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Tree measurements.

804. **U.S. Department of Agriculture, Forest Service**. **1980**. Field instructions for timber resource inventories, Region 6. Unnumbered Handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6, Division of Timber Management. Irregular p. **Notes**: An original copy.
Abstract: This comprehensive field manual was designed to present the instructions, definitions, procedures, and classifications to be used by Region 6 when conducting timber resource inventories in Oregon and Washington. Instructions are organized in two parts: the first part covers the procedures for locating, establishing and measuring new 10-point variable-radius sample plots; the second part covers the procedures to be used for relocating and remeasuring previously-established fixed-radius plots. The handbook contains the following sections: introduction (purpose, objectives, survey design, description of the plot, design of sample plot, and quality control); procedures for 10-point sample measurement (locating the plot on the ground, referencing and establishing the plot, and site trees); area identification; tree identification; tree measurement; tree characteristics and tree classification; area classification; remeasurement; and appendix.
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Tree measure-

ments.

805. **U.S. Department of Agriculture, Forest Service**. **1963**. Field procedures for forest inventories. Handbook with file designation 2410. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. 68 p. **Size**: 5” x 8”. **Notes**: An original copy.
Abstract: This comprehensive handbook contains the following sections: introduction; general information; locating the plot; taking and recording plot data; supplementary crew instructions; and safety precautions. Appendix material includes: determination of local photo scale; guide for estimating decay; site index tables; deterioration characteristics for post-dating tree mortality; declination factors for representative areas in the Pacific Northwest; examples of completed forms; and instructions for remeasuring a plot. This guide has detailed descriptions of how to take inventory measurements and lists of all appropriate codes.
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Tree measurements.

806. **U.S. Department of Agriculture, Forest Service**. **1943**. Fire control handbook. Unnumbered Internal Handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p.
Notes: Two original copies are in the library archives. The dates are variable, depending upon the dates of supplements or revisions. Dates from 1943 to the late 1950s or early 1960s are contained in this copy.
Abstract: This copy is not complete, but does include many parts and chapters from the entire handbook. Included in this copy is: part I (fire prevention), chapter 3: law enforcement; part I, chapter 4: prevention methods; part II (preparedness), chapter 4: miscellaneous plans; part II, chapter 8: smokechasing; part II, chapter 9: general instructions for fire guards; part III (suppression), chapter 1: fire fighting; and part III, chapter 2: use of water. Also included at the end of this copy was a 10-page Safety Plan for the Umatilla National Forest (dated 1960), including a list of local physicians to contact in case of injury. Following the Safety Plan is a 1960 District Organization Plan for the Ukiah Ranger District, when F. G. Whitney was the District Ranger and Lloyd A. Waid was the assistant Ranger.
Keywords: Fire control/Fire fighting/Fire prevention/Forest fires/Forest organization/Historical document/Ukiah RD/North Fork John Day RD.

807. **U.S. Department of Agriculture, Forest Service**. **1936**. Forest facts and statistics for the North Pacific Region. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service. Variable p.
Notes: A photocopy of an original. Current photocopy is missing tables 18, 20, 32, and 33 because the original was missing them.
Abstract: This report provides statistics about the Pacific Northwest Region through a series of tables covering the following areas: fire control; government owned improvements; timber management; wildlife and range management; accounts; recreation and lands; education and information; forest resources of Oregon and Washington; lumber production; Columbia Basin report, including Oregon, Washington, Idaho and Montana; pulpwood resources of western Oregon and western Washington; land ownership distribution; and highest peaks in Oregon and Washington.
Keywords: Community development/Forestry extension information/Forest inventory/Pacific Northwest/Historical document/Columbia basin.

808. **U.S. Department of Agriculture, Forest Service**. **1938**. Forest farming. Farmers’ Bulletin 1794. Washington, DC: U.S. Department of Agriculture. 17 p. **Size**: 6” x 9”. **Notes**: An original copy. Issued in April, 1938.
Abstract: It is important to keep timber stands growing thriftily. The first essential purpose for this is to exclude fire and, in the case of hardwoods, also livestock. Fire destroys the soft, spongy leaf litter and enrichening humus which are both very necessary for maintaining the tree growth in a thrifty condition. It is also important to cut the timber crop lightly so as to avoid forming large openings where the sun and wind can dry out the soil; but more essentially so as to keep the woodland well stocked with trees. Only so can the owner get the largest production and best quality of timber per unit of area for his own use or for sale. Selective cutting, or frequent light cutting, is unquestionably the best method for farmers. A heavy or clear cutting, even with a few trees left for seed, means waiting many before the land yields another timber crop and the owner receives an income from his land. The remaining step in good timber farming is the planting of small forest tree seedlings to fill in large openings in the woods, stop soil erosion, or utilize worn out or unproductive land on the farm.
Keywords: Forest management/Farm forests/Forestry extension information/Historical document/Windbreaks.

809. **U.S. Department of Agriculture, Forest Service**. **1928**. A forest fire prevention handbook for the schools of Oregon. Miscellaneous Publication No. 20. Washington, DC: U.S. Department of Agriculture. 30 p. **Size**: 6” x 9”.

Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Issued in cooperation with the superintendent of public instruction for Oregon's schools, this booklet was intended to provide teachers with forest fire prevention material in a convenient form. It provides a series of lesson plans, including these: the forests of Oregon (location, area, kinds of trees, amount of standing timber and annual cut, water and forage resources, and recreation); the forest organizations of Oregon; causes of fires; the effects of fire; fire prevention; how fires are detected and fought; and six rules for preventing fire in the forests. A short list of forestry publications that will be helpful to the teacher is also provided.
Keywords: Forest fires/Fire prevention/Fire control/Forestry extension information/Historical document.

810. **U.S. Department of Agriculture, Forest Service**. **1937**. Forest fire record. Forest Facts No. 6. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Section of Education and Information. 1 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This item consists of a single page with two line graphs. The top graph is entitled "All reportable fires inside and outside National Forest boundaries" and pertains to forest fires in Region 6 during a 10-year period from 1927 to 1936. The bottom graph is entitled "Fires within National Forest boundaries" and pertains to forest fires in Region 6 during a 10-year period from 1927 to 1936. Each graph includes three lines, one entitled "Total from all causes," another labeled "Number of man-caused fires" and a third called "Fires caused by campers and smokers." Both graphs show the number of fires by category and by year; the acreage burned is not included. The maximum number of fires occurred in 1930, with the second highest number being in 1935.
Keywords: Forest fires/Historical document/Pacific Northwest Region.

811. **U.S. Department of Agriculture, Forest Service**. **1933 (app.)**. Forest insect handbook. Unnumbered handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 122 p.
Notes: An original copy.
Abstract: This handbook was prepared jointly by the Forest Service's Pacific Northwest Regional Office, and the forest insect field station of the Bureau of Entomology, both of which were headquartered in Portland. The purpose of this handbook was to furnish forest officers with a description of the more important forest insects of the Region, a general idea of their habits and biology, and to provide some information about how to control them. It is divided into 3 parts, as follows: part 1 describes the more important forest insects of the Region; part 2 provides a detailed discussion about the western pine beetle and its control; and part 3 describes forest insect research and discusses miscellaneous insect control problems other than those dealing with western pine beetle. This handbook includes many excellent drawings of forest insects.
Keywords: Bark beetles/Douglas-fir beetle/Fir engraver/Historical document/Insect control/Insect damage/Insects/Mountain pine beetle/Pacific Northwest Region/Pandora moth/Spruce beetle/Turpentine beetles/Western pine beetle.

812. **U.S. Department of Agriculture, Forest Service**. **1964**. Forest inventory remeasurement instructions. Timber Management Planning Handbook, 2413.11a, Chapter 2. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. 8 p. **Size**: 5" x 8". **Notes**: An original copy.
Abstract: This short handbook has the following sections: plot location (time and effort, partial recovery); plot reclassification; and plot examination. This handbook discusses how to relocate, remeasure, or reestablish previous plots; it does not provide instructions for establishment of new plots and does not include any codes.
Keywords: Forest inventory/Forest measurements/Historical document/Pacific Northwest Region/Tree measurements.

813. **U.S. Department of Agriculture, Forest Service**. **[Date unknown]**. Forest photography. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 10 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Although no cover page or other identification was included with this report, it was likely authored by George Sudworth, who was instrumental in institutionalizing photography during the early years of the U.S. Forest Service. This report or handbook includes the following sections: general views; special views (forest types, the single tree, fire, lumbering, effect of grazing, natural enemies, and forest management); rules for exposure; and field notes for photographs. This guide is full of direct, no-nonsense recommendations such as "do not make snap shots in dense forest; do not hold camera in hand while making time exposure; select subject carefully;" etc.
Keywords: Historical document/Photography.

814. **U.S. Department of Agriculture, Forest Service**. **1938**. The Forest Products Laboratory: a brief account of its work and aims. Miscellaneous Publication No. 306. Washington, DC: U.S. Department of Agriculture, Forest Ser-

vice. 33 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: The Forest Products Laboratory, a Forest Service research unit, is the only institution in the United States concerned wholly with the investigation of wood and wood products and their adaptation to diversified fields of use. This bulletin covers the following topics: a national institution for wood utilization research; timber harvesting and conversion; silvicultural relations; chemistry, composition, and derived products of wood; timber mechanics and structural research; wood seasoning and moisture control; wood treating processes for protection and service; wood pathology; pulp and paper; and how to use the laboratory.
Keywords: Historical document/Wood characteristics/Wood preservation/Wood utilization/Forest Products Laboratory.

815. **U.S. Department of Agriculture, Forest Service**. **1908**. Forest Service atlas: extracts from the statistical volume of the Forest atlas for the Fiscal Year 1907. Unnumbered Report. Washington, DC: U.S. Department of Agriculture, Forest Service, Office of Geography. 30 p. **Notes**: An original copy.
Abstract: This atlas contains a series of maps, diagrams, and tables that provide information on a wide variety of national forest programs and uses, including the following: land disposal, patrol statistics, forest fires, communication improvements, permanent improvements, receipts, growth (mostly related to growth in receipts, workforce, and program areas), timber, grazing, permits and special uses, silvics, cooperative activities, timber treating and processing facilities, lumber cut by species, and publications of the Forest Service.
Keywords: Historical document/Program administration/Forest management/Range management/United States.

816. **U.S. Department of Agriculture, Forest Service**. **1936**. The forest survey of eastern Oregon and eastern Washington: explanatory text to accompany forest statistics for each county. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 8 p.
Notes: A photocopy of an original.
Abstract: A forest survey of the United States was authorized by the McSweeney-McNary Forest Research Act of 1928. The forest survey program was designed to provide a comprehensive and detailed investigation of the existing timber resources by volume and area; the drain upon the forests through cutting and through loss by fire, insects, and diseases; current and potential forest growth; and present and prospective wood requirements. Forest survey work in the Pacific Northwest began in 1930 when field work was initiated in the Douglas-fir region of western Oregon; it began in eastern Oregon’s pine region in 1933. At the time this report was published (February 1, 1936), field work on the eastern Oregon and Washington portion of the Pacific Northwest survey was almost complete, with the balance scheduled for completion later in 1936. This report describes how the surveys were completed and how survey results were going to be presented in the individual county reports. It includes the following sections: introduction; explanation of methods and terms (sources of data, timber estimating standards, ownership classes, age classes and degree of stocking, tree species, definition of terms); definitions of types; nonforest land types; woodland types; and timberland types. Note that the history archives contains numerous forest survey reports, not just from the first set of surveys (1930s) but also from later iterations (1940s and 1950s). This report is helpful for interpreting the 1930s vintage surveys and would also be useful with the 1930s forest type mapping (see Andrews and Cowlin (1936, 1937) and Sankela and Lynch (1936) for examples of forest type maps produced by the forest survey program).
Keywords: Forest inventory/Historical document/Eastern Oregon/Eastern Washington/Forest mapping/Forest types/Timber surveys.

817. **U.S. Department of Agriculture, Forest Service**. **1949**. Forest type classification for Pacific Northwest region. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 15 p.
Notes: An original copy. Prepared jointly by the Division of Forest Economics, Pacific Northwest Forest and Range Experiment Station, and the Division of Timber Management, Pacific Northwest Region.
Abstract: This early Forest Service handbook describes a new classification scheme that was to be used with type mapping and field surveys conducted by the Forest Survey program. The new classification provides type symbols that are a product of vegetation type (Douglas-fir, Juniper, Grass, etc.), stand size classes (seedlings and saplings, large sawtimber, etc.) and a stocking class (poor, medium, and well stocked). When appropriate, modifiers to the symbols are used for condition classes (nonstocked clearcuts, fire areas, defoliated areas, etc.) and treatment history (residual stand, restocked clearcut, planted area). Lower-case letters are used to denote actual species composition within types (subalpine fir, grand fir, red fir, etc.), and an age class to the nearest 10 years. A table correlating new types with those developed for the 1930s forest surveys is also provided.
Keywords: Forest inventory/Forest mapping/Historical document/Pacific Northwest/Forest types.

818. **U.S. Department of Agriculture, Forest Service**. **1908**. General instructions for marking timber on the [blank]

national forest; Engelmann spruce region. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 15 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document provides general rules, to be varied at the discretion of the forest officers in charge, for marking timber on the [fill in the blank] national forest. The rules were supplementary to the general instructions in "The Use Book." These rules pertain to the "Engelmann spruce region," which apparently meant those national forests where the Engelmann spruce forest type was a major component. The instructions begin by stating that in moist situations where Engelmann spruce is well adapted, it should be favored over other species. In dense, pure stands of spruce on cold, moist sites at high elevations, the recommendation was to not cut any heavier than a thinning – removing overripe, suppressed, and defective trees but not to the extent where less than one-half to two-thirds of the stand would remain after harvest. That and other recommendations were based primarily on the shallow-rooted nature of spruce and its high windthrow risk, especially on exposed sites. In mixed stands, the instructions state that subalpine fir should be discriminated against whenever possible, although it too could be thinned if growing in almost-pure stands where spruce could not be favored. Instructions are also provided for selection cutting in pure stands of lodgepole pine; windthrow considerations were also important for that type. When marking uneven-aged lodgepole stands, the primary considerations were the danger from windfall, leaving enough trees to form the basis for a future cut, and the removal of all undesirable individuals. For the more common situation of even-aged stands of lodgepole pine, the instructions recommend clean (clear) cutting in strips, with alternate strips either uncut or lightly thinned to remove diseased and defective trees only. Next, the instructions cover pure yellow (ponderosa) pine stands, followed by a short narrative for mixed stands of various species. The final section (3½ pages) is entitled "General Rules." It describes general policies such as: "as a general rule, at least one-third of the present merchantable stand should be left on every sale area to form the basis for a second cut." The balance of that section provides recommendations about how to handle stands with insect or disease problems, form defects, scenic concerns, previous harvest impacts, and other considerations. The instructions end with two admonitions: "when in doubt whether a defective tree contains merchantable material, mark it;" and "when in doubt whether a tree is needed for seed or protection, or is a proper tree to leave for the future crop, leave it."
Keywords: Engelmann spruce/Forest management/Historical document/Silvicultural systems/Subalpine fir/Timber sales/Selection cutting/Lodgepole pine/Timber marking.

819. **U.S. Department of Agriculture, Forest Service**. **1908**. General instructions for marking timber on the [blank] national forest; lodgepole pine region. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 11 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document provides general rules, to be varied at the discretion of the forest officers in charge, for marking timber on the [fill in the blank] national forest. The rules were supplementary to the general instructions in "The Use Book." These rules pertain to the "lodgepole pine region," which apparently meant those national forests where the lodgepole pine forest cover type was a major component. This document contains the following sections: pure lodgepole pine stands; pure yellow pine stands; mixed stands of lodgepole pine, Engelmann spruce and other species; and general rules. For pure, uneven-aged lodgepole pine stands, it was recommended that partial cuttings take the form of either a very light "thinning," or a very heavy harvest that left only enough trees for another entry at some point in the distant future. When marking those stands, the primary considerations were the danger from windfall, leaving enough trees to form the basis for a future cut, and the removal of all undesirable individuals. In the more common situation of even-aged lodgepole pine, it was recommended to clearcut in strips, with the orientation of the strips based on the risk of windthrow, avalanches, or soil erosion. The alternate strips were to be either uncut or lightly thinned to remove diseased and defective trees only. There were four considerations for pure yellow pine stands: 1) leave all young trees unless plainly undesirable from serious unsoundness or overcrowding, or so misshapen that they will not develop into valuable timber trees, and in general all thrifty trees which will plainly be much more valuable at the time a second cut may reasonably be expected in from thirty to fifty years; 2) never make an opening of more than one-quarter of an acre, unless good reproduction was already well established; 3) before marking a tree for removal, be sure that it is not needed for seed, especially if it is a young, thrifty yellow pine or a large, thrifty black jack; and 4) when an area includes enough thrifty pine timber to make it possible to leave from 1,500 to 2,000 board feet of merchantable timber per acre without jeopardizing the economic viability of the present cut, it should be left as the basis for an early second crop. In partial cuttings without advance regeneration, the recommendation was to leave two to five young, thrifty yellow pines with full crowns on each acre. The leave trees should be left in groups or clumps, since they were more windfirm that way and tended to replicate the natural "clumpy" pattern of virgin yellow pine forest. In mixed stands, market considerations and site conditions were the main factor dictating the species to be favored. It was recommended that subalpine fir or other low-value species be removed whenever possible in order to provide more growing space for Douglas-fir, Engelmann spruce, lodgepole

pine, or any species more economically valuable than the true firs. Spruce was to be favored on moist sites; lodgepole pine on areas that were sterile and drier. Douglas-fir tended to be most windfirm species in mixed stands, so it was recommended for retention on exposed sites. The final section (3½ pages) is entitled "General Rules." It describes general policies such as: "as a general rule, at least one-third of the present merchantable stand should be left on every sale area to form the basis for a second cut." The balance of that section provides recommendations about how to handle stands with insect or disease problems, form defects, scenic concerns, previous harvest impacts, and other considerations. The instructions end with two admonitions: "when in doubt whether a defective tree contains merchantable material, mark it;" and "when in doubt whether a tree is needed for seed or protection, or is a proper tree to leave for the future crop, leave it."
Keywords: Forest management/Historical document/Silvicultural systems/Timber sales/Selection cutting/Timber marking/Engelmann spruce/Lodgepole pine/Ponderosa pine/Douglas-fir.

820. **U.S. Department of Agriculture, Forest Service**. **1908**. General instructions for marking timber on the [blank] national forest; western yellow pine region (northern division). Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 16 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document provides general rules, to be varied at the discretion of the forest officers in charge, for marking timber on the [fill in the blank] national forest. The rules were supplementary to the general instructions in "The Use Book." These rules pertain to the "western yellow pine region," which apparently referred to national forests where the western yellow (ponderosa) pine forest cover type was a major component. The instructions begin with these directions for pure yellow pine stands: "leave all young trees unless plainly undesirable from serious unsoundness or overcrowding, or so misshapen that they will not develop into valuable timber trees, and in general all thrifty trees which will plainly be much more valuable at the time a second cut may reasonably be expected in from thirty to fifty years." It also states that an opening of more than one-quarter of an acre should never be made in the pure yellow pine forest, unless good reproduction was already well established. In partial cuttings without advance regeneration, the recommendation was to leave two to five young, thrifty yellow pines with full crowns on each acre. The leave trees should be left in groups or clumps, since they were more windfirm that way and tended to replicate the natural "clumpy" pattern of virgin yellow pine forest. For pure, uneven-aged lodgepole pine stands in the western yellow pine region, it was recommended that partial cuttings take the form of a very light "thinning" or a very heavy entry that left only enough trees for another entry at some point in the distant future. When marking those stands, the primary considerations were the danger from windfall, leaving enough trees to form the basis for a future cut, and the removal of all undesirable individuals. In the more common situation of even-aged lodgepole pine, it was recommended to clearcut in strips, with the orientation of the strips based on the risk of windthrow, avalanches, or soil erosion. The alternate strips were to be either uncut or lightly thinned to remove diseased and defective trees only. When dealing with Engelmann spruce stands at high elevations, it was recommended that cuttings be light, thinning-type entries that would serve to protect the site and prevent the soil from drying out. Windthrow risk was the primary concern in spruce stands. In mixed stands, it was recommended that subalpine fir be removed whenever possible in order to provide more growing space for Engelmann spruce, lodgepole pine, or any species more economically valuable than the true firs. The final section (3½ pages) is entitled "General Rules." It describes general policies such as: "as a general rule, at least one-third of the present merchantable stand should be left on every sale area to form the basis for a second cut." The balance of that section provides recommendations about how to handle stands with insect or disease problems, form defects, scenic concerns, previous harvest impacts, and other considerations. The instructions end with two admonitions: "when in doubt whether a defective tree contains merchantable material, mark it;" and "when in doubt whether a tree is needed for seed or protection, or is a proper tree to leave for the future crop, leave it."
Keywords: Forest management/Historical document/Silvicultural systems/Timber sales/Selection cutting/Timber marking/Engelmann spruce/Lodgepole pine/Ponderosa pine.

821. **U.S. Department of Agriculture, Forest Service**. **1908**. General instructions for marking timber on the [blank] national forest; western white pine region. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 16 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document provides general rules, to be varied at the discretion of the forest officers in charge, for marking timber on the [fill in the blank] national forest. The rules were supplementary to the general instructions in "The Use Book." These rules pertain to the "western white pine region," which apparently meant the national forests where the western white pine forest cover type was a major component. This document contains the following sections: pure white pine stands; pure yellow pine stands; pure lodgepole pine stands; Engelmann spruce; Blue spruce; mixed stands of various species; and general rules. For pure white pine stands, the objective of marking was

to remove undesirable individuals (diseased, unsound, insect-attacked, dead, overmature, etc.). If possible, the marking should leave 50 to 75 young, thrifty, well-formed trees per acre. These directions are provided for pure yellow pine stands: "leave all young trees unless plainly undesirable from serious unsoundness or overcrowding, or so misshapen that they will not develop into valuable timber trees, and in general all thrifty trees which will plainly be much more valuable at the time a second cut may reasonably be expected in from thirty to fifty years." It also states that an opening of more than one-quarter of an acre should never be made in the pure yellow pine forest, unless good reproduction was already well established. In partial cuttings without advance regeneration, the recommendation was to leave two to five young, thrifty yellow pines with full crowns on each acre. The leave trees should be left in groups or clumps, since they were more windfirm that way and tended to replicate the natural "clumpy" pattern of virgin yellow pine forest. For pure, uneven-aged lodgepole pine stands, it was recommended that partial cuttings take the form of either a very light "thinning," or a very heavy harvest that left only enough trees for another entry at some point in the distant future. When marking those stands, the primary considerations were the danger from windfall, leaving enough trees to form the basis for a future cut, and the removal of all undesirable individuals. In the more common situation of even-aged lodgepole pine, it was recommended to clearcut in strips, with the orientation of the strips based on the risk of windthrow, avalanches, or soil erosion. The alternate strips were to be either uncut or lightly thinned to remove diseased and defective trees only. When dealing with the Engelmann spruce stands that occurred at higher elevations or on moist sites, it was recommended that cuttings be light, thinning-type entries that would serve to protect the site and prevent the soil from drying out. Windthrow risk was the primary concern in spruce stands. In mixed stands, market considerations were the main factor dictating the species to be removed. It was recommended that subalpine fir or other low-value species be removed whenever possible in order to provide more growing space for white pine, Engelmann spruce, lodgepole pine, or any species more economically valuable than the true firs. The final section (3½ pages) is entitled "General Rules." It describes general policies such as: "as a general rule, at least one-third of the present merchantable stand should be left on every sale area to form the basis for a second cut." The balance of that section provides recommendations about how to handle stands with insect or disease problems, form defects, scenic concerns, previous harvest impacts, and other considerations. The instructions end with two admonitions: "when in doubt whether a defective tree contains merchantable material, mark it;" and "when in doubt whether a tree is needed for seed or protection, or is a proper tree to leave for the future crop, leave it."
Keywords: Forest management/Historical document/Silvicultural systems/Timber sales/Selection cutting/Timber marking/Engelmann spruce/Lodgepole pine/Ponderosa pine/Western white pine.

822. **U.S. Department of Agriculture, Forest Service**. **1952**. Highlights in the history of forest conservation. Agriculture Information Bulletin No. 83. Washington, DC: U.S. Department of Agriculture, Forest Service. 23 p. **Size**: 6" x 9". **Notes**: A photocopy of an original.
Abstract: This bulletin describes important events and legislation affecting forest resources of the United States. Section titles are: in colonial days, the young republic, government forest work begins, the conservation movement grows, a period of rapid progress (forest conservation in World War II; since World War II), conclusions, and an appendix that provides the establishment dates and headquarters location for each of the national forests in the United States.
Keywords: Historical document/Forest history/Forest management.

823. **U.S. Department of Agriculture, Forest Service**. **1905?** How to transplant forest trees. Forest Planting Leaflet No. 8. Washington, DC: U.S. Department of Agriculture, Forest Service. 4 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This short leaflet describes how to transplant forest trees. The following topics are discussed: the proper season; treatment before transplanting; puddling; heeling in; transplanting in nurseries; and transplanting from nursery to field.
Keywords: Nursery practices/Artificial regeneration/Tree planting/Historical document/Seedling transplanting.

824. **U.S. Department of Agriculture, Forest Service**. **1911?** Insect control project, northeastern Oregon, 1911. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 1:63,360; [Projection unknown]; 31" x 43"; Thematic.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The history archives contains a half dozen or more reports regarding the 1911 insect control project on the Whitman National Forest. It is likely that this map was prepared to accompany one of them, although it is unknown which one because of the few annotations or notes on it. The map extends from the Burnt River on the south to the Powder River and Antone Creek on the north (township 6 south, ranges 37 and 38 east). The towns of Hereford, Bourne, Baker City and Sumpter, Oregon are shown on the map. The legend for this map includes three items:

yellow (ponderosa) pine areas treated; lodgepole areas treated; and Forest boundary. The legibility of this map is not great because the original copy in the National Archives was a blue-line or diazo print (white lettering and lines on a dark blue background) and this copy was made on a normal (electrostatic) copier, which could not handle the dark blue background very well.
Keywords: Bark beetles/Dendroctonus/Historical map/Insect control/Lodgepole pine/Mountain pine beetle/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains.

825. **U.S. Department of Agriculture, Forest Service**. **1923**. Instructions for cutover area records; part 1 – clear cutting sales. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 9 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: There was no one thing so fundamental to successful forest management as securing satisfactory reforestation on cutover areas. The primary objective of managing the national forests would not be accomplished if the timber harvest sale areas did not result in prompt reforestation. The attainment of prompt reforestation was second only to protection of the existing forests from fire, and could logically be considered more important than fire protection with regard to overmature stands or inaccessible areas. Unless satisfactory regeneration resulted from timber cuttings, the whole scheme of national forest management would fail. For that reason, there was an urgent need for a systematic record of what takes place during the timber sale process and thereafter during the restocking period. By keeping a systematic record, it would be possible to know what the actual regeneration results were, and the factors that led to those results. The rest of this document describes a detailed cutover area record that was designed to be used with clear cutting timber sales. It consisted of five to seven sections: general description of the sale and timber before cutting; a cumulative record for each unit of the sale, describing the pre-harvest conditions, logging operations, slash disposal, and annual or periodic entries describing regeneration progress; summaries of conditions on the cutover areas as a whole; cumulative record of the seed crop for both cutover areas and uncut timber; and a copy of the historical map prepared according to standard instructions. In general, the cutover records were required for larger "project" sales or for groups of small sales located in the same general vicinity. The record was to be kept in a loose-leaf style on atlas sheets bound in a suitable binder. Multiple copies were to be kept – one copy was for the Supervisor's Office and the other was to reside in the files of the Forest Officer in charge of the sale. Detailed instructions are provided, including typology (margins, column layout, corner notations, etc.) for the records as a whole and specific items for each of the five sections. Throughout the instructions, advice is offered about how to establish sample quadrats in representative portions of cutover areas and how to determine the number of quadrats to use and their distribution (spacing) in the unit.
Keywords: Clearcutting/Cutover areas/Forest management/Historical document/Record keeping/Natural regeneration/Timber management.

826. **U.S. Department of Agriculture, Forest Service**. **1923**. Instructions for cutover area records; part 2 – selection cutting sales. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 11 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: There was no one thing so fundamental to successful forest management as securing satisfactory reforestation on cutover areas. The primary objective of managing the national forests would not be accomplished if the timber harvest sale areas did not result in prompt reforestation. The attainment of prompt reforestation was second only to protection of the existing forests from fire, and could logically be considered more important than fire protection with regard to overmature stands or inaccessible areas. Unless satisfactory regeneration resulted from timber cuttings, the whole scheme of national forest management would fail. For that reason, there was an urgent need for a systematic record of what takes place during the timber sale process and thereafter during the restocking period. By keeping a systematic record, it would be possible to know what the actual regeneration results were, and the factors that led to those results. The rest of this document describes a detailed cutover area record that was designed to be used with selection cutting timber sales. It consisted of five to seven sections: general description of the sale and timber before cutting; a cumulative record for each unit of the sale, describing the pre-harvest conditions, logging operations, slash disposal, and annual or periodic entries describing regeneration progress; summaries of conditions on the cutover areas as a whole; cumulative record of the seed crop for both cutover areas and uncut timber; and a copy of the historical map prepared according to standard instructions. In general, the cutover records were required for larger "project" sales or for groups of small sales located in the same general vicinity. The record was to be kept in a loose-leaf style on atlas sheets bound in a suitable binder. Multiple copies were to be kept – one copy was for the Supervisor's Office and the other was to reside in the files of the Forest Officer in charge of the sale. Detailed instructions are provided, including typology (margins, column layout, corner notations, etc.) for the records as a whole and specific items for each of the five sections. Throughout the instructions, advice is offered about how to

establish sample quadrats in representative portions of cutover areas and how to determine the number of quadrats to use and their distribution (spacing) in the unit.
Keywords: Cutover areas/Forest management/Historical document/Record keeping/Natural regeneration/Timber management/Selection cutting.

827. **U.S. Department of Agriculture, Forest Service**. **1912**. Instructions for intensive reconnaissance east of the Cascade Mountains, District 6. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 35 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is the edition of April 12, 1912; another edition dated May 12, 1914 is also in the history archives. These instructions were issued by the District (Regional) Forester and were intended for use by individuals or parties doing intensive reconnaissance, timber sale examinations, or grazing evaluations in that portion of Oregon and Washington lying east of the Cascade Mountains. The intensive reconnaissance was not a timber estimate, nor a land classification, nor a grazing examination, but a combined study of all those items and more (topography, soils, etc.). The goal of this Manual was to standardize field methods, accuracy standards, and map preparation guidelines so that reconnaissance reports would be reasonably uniform throughout the District. The concept was that after intensive reconnaissance work had been completed, there would be little or no need for subsequent field examinations, except for small areas where unusual detail was desired or to determine timber sale or grazing allotment boundaries after receiving a specific application. This manual includes the following sections: introduction; collection of the data; field compilation; final report; explanation and notes; and legends.
Keywords: Eastern Oregon/Forest inventory/Forest mapping/Historical document/Land classification/Timber reconnaissance.

828. **U.S. Department of Agriculture, Forest Service**. **1914**. Instructions for intensive timber reconnaissance east of the Cascade Mountains. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 52 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is the edition of May 12, 1914, although it also includes a one-page supplement dated June 17, 1914 that makes 5 minor changes to the May 14th version. These instructions were issued by the District (Regional) Forester and were intended for use by all individuals or parties doing intensive timber reconnaissance, timber sale examinations, or forest-type mapping in that portion of Oregon and Washington lying east of the Cascade Mountains. It also includes instructions for grazing reconnaissance when one was to be conducted simultaneously with a timber reconnaissance. The goal of this Manual was to standardize field methods, accuracy standards, and map preparation guidelines so that timber reconnaissance and sale examination reports would be reasonably uniform throughout the District. The concept was that after intensive reconnaissance work had been completed, there would be little or no need for subsequent field examinations, except for small areas where unusual detail was desired or to determine timber sale boundaries after receiving a specific application for a timber sale. This manual includes the following sections: introduction; collection of data; compilation in the field; office computations and final report; field equipment; legend for timber cover and age classification map; and legend for forage cover classification map. [Note that the Forester (Chief) issued instructions for intensive timber reconnaissance on April 3, 1914 (copy included in the history archives), so this document may have been the District's response to the national direction.]
Keywords: Eastern Oregon/Forest inventory/Forest mapping/Historical document/Land classification/Timber reconnaissance.

829. **U.S. Department of Agriculture, Forest Service**. **1912**. Instructions for marking timber in the yellow pine region, District VI. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 4 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Much of the commercial forest east of the Cascade Mountains in Oregon and Washington was comprised mostly of western yellow (ponderosa) pine. Since those forests were primarily uneven-aged, it was recommended that they be managed by the selection system. Based on the information available, it was thought that the period between cuttings (cutting cycle) should be 60 years, and that no trees should be cut until they were at least 180 years old (i.e., a rotation age of 180 years). The following general principles pertained to the yellow pine region: 1) the cutting should be fundamentally an improvement cutting, with the forest officer doing the marking first deciding what should be left, and then marking whatever remains; 2) aim to mark the thoroughly mature trees of all species and those trees that will not survive and grow until the next cutting 60 years hence; 3) reserve a well distributed stand of thrifty saplings, poles and young standards that are capable of surviving to form the next crop; 4) reserve on average from 20 to 25 percent of the estimated volume of trees over 12 inches in diameter; 5) exclude areas

from timber sales that do not have enough mature volume to make logging viable, since that would result in immature timber being cut in order to make the unit profitable; 6) make the marking group-wise if all the trees in an area are mature, although cleared areas of more than an acre should be avoided; 7) mark the following tree classes in this order of preference: a) all defective and damaged trees, although small basal scars or similar injuries should be ignored since few perfect trees are to be found in the forest; b) all insect-infested trees; c) all suppressed trees; and d) all mature trees that will apparently not survive until the next entry; and 8) marking should favor tree species in this order: yellow pine, sugar pine, western larch, Douglas-fir, grand fir, and lodgepole pine (the last two species were considered forest weeds). Pure stands of yellow pine occurred on the "slope" type; it was recommended that dense groups of young "blackjack" pine be thinned when possible in a timber sale. Mixed stands tended to occur as the "north slope" sub-type in the Blue Mountains. Yellow pine should be favored in those stands, although not necessarily at the expense of western larch or Douglas-fir. Although those two species had low value at the time this report was written, it was expected that their value would increase with time and they should not be sacrificed for no good reason. Even though neither larch nor Douglas-fir were considered to be inferior species, it was recommended that larch be preferred over the Douglas-fir when both occurred on the same site. Stands with little or no yellow pine were referred to as the "transition" type – they were typically not included in a timber sale unless it was impossible to exclude them. As was the case for the north slope stands, it was recommended that inferior species in the transition stands (grand fir, lodgepole pine) be marked to the lowest possible diameter limit in order to remove as many of them as possible. If the whole stand was comprised of inferior species and their removal would result in a clearcut, it was recommended that the stand not be harvested.
Keywords: Forest management/Historical document/Silvicultural systems/Timber sales/Selection cutting/Ponderosa pine/Timber marking/Inferior tree species.

830. **U.S. Department of Agriculture, Forest Service**. **1962**. Instructions for type-mapping forest types in the Pacific Northwest. Unnumbered Report with file designation 2410. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. 18 p. **Notes**: An original copy.
Abstract: This document describes procedures and codes to be used when preparing forest type maps in Region 6 of the Forest Service. It discusses the following topics: forest type symbols and definitions; commercial forest types; type map color legend; type-mapping procedures; delineation procedure; checking; two-story type mapping; and type map transfer.
Keywords: Forest inventory/Forest types/Historical document/Pacific Northwest Region.

831. **U.S. Department of Agriculture, Forest Service**. **1947**. Management of second-growth forests in the Douglas-fir region. Unnumbered Report produced by the Douglas-fir Second-Growth Management Committee. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 151 p. **Notes**: An original copy.
Abstract: This handbook was the first product from a Douglas-fir second-growth management committee. That committee had three main goals: produce a document describing what foresters already know about management of second-growth Douglas-fir; the PNW Forest and Range Experiment Station would set up research plots in representative second-growth stands; and the Station would study and report on case histories of second-growth stands where some form of management has occurred. This document met the first of those goals by assembling all of the known information on management of second-growth Douglas-fir. It contains the following main sections: introduction; growth and yield of young forests in the Douglas-fir region; intermediate cuttings; regeneration cuttings; rehabilitating poorly stocked and nonstocked lands by planting; protecting the growing stand; logging and marketing; case histories; and summary and recommendations.
Keywords: Douglas-fir/Forest management/Historical document/Second-growth stands/Silviculture/Western Oregon/Western Washington.

832. **U.S. Department of Agriculture, Forest Service**. **1970**. Management of western larch – northern region. FSH Handbook 2471.15 R1. Missoula, MT: U.S. Department of Agriculture, Forest Service, Northern Region. Variable p. **Notes**: An original copy. Issued in November, 1970.
Abstract: This is a standard Forest Service Handbook issued by the Northern Region. It contains the following chapters: introduction; management objectives for western larch; silvicultural description; diseases; insects; management guidelines; and appendix. This informative and extensive handbook contains particularly detailed chapters about larch silvics (chapter 300); diseases, especially dwarf mistletoe (400); and management guidance (600). The detailed appendix also contains very good information.
Keywords: Forest management/Larch dwarf mistletoe/Silvics/Timber management/Montana/Western larch/Northern Region.

833. **U.S. Department of Agriculture, Forest Service**. **1924**. Marking instructions for the larch-fir type, District 1. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 6 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: These marking instructions include the following sections: type characteristics affecting marking; classification of stands; immature even-aged stands; mature even-aged stands; uneven-aged stands; treatment of minor species; tie cutting; slash disposal; and examples. The larch-fir type, which typically originated following fires, consists of larch and Douglas-fir, although yellow pine, white pine, white fir and lodgepole pine are frequent associates. Since larch is not tolerant of shade, the instructions recommend that Douglas-fir be removed at the expense of larch whenever possible because larch was considered the more desirable tree. Douglas-fir was described as a prolific seed producer, bearing good seed crops nearly every year. Larch also bore seed nearly every year, but good crops only occurred every 5 or 6 years. It was observed that larch was frequently infected with dwarf mistletoe and that infected trees often died. In mixed stands, it was stated that yellow pine and white pine should be encouraged whenever possible. The "examples" section provides actual "acres" marked under varying conditions. Acre 1 occurred on an east slope and had 18 mature larch, 3 mature yellow pine, four mature Douglas-firs, and a variety of reproduction dominated by 27 Douglas-firs. Acre 2 was on a flat ridge top and consisted of a fairly heavy mixed stand of larch and yellow pine. A table shows the cut and leave recommendations for that acre. Acre 3 was affected by fire and much of the area consists of reproduction 10 to 20 feet tall. Recommendations are provided for the cut and leave trees for larch, Douglas-fir and yellow pine. Acre 4 is on a north slope and consists mostly of Douglas-fir (70%) and larch (30%) saplings. Cutting recommendations for the mature trees on that acre are also described.
Keywords: Forest management/Historical document/Silvicultural systems/Timber sales/Selection cutting/Timber marking/Rocky Mountain Douglas-fir/Western larch/Ponderosa pine.

834. **U.S. Department of Agriculture, Forest Service**. **1922**. Memorandum for Mr. Guthrie. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 2 p.
Notes: A photocopy of an original.
Abstract: This short accession consists of a series of interesting quotes from Washington Irving's book entitled "Adventures of Captain Bonneville U.S.A." There are six passages quoted from the book, all of which pertain to when Captain Bonneville and his party of trappers were enroute across the Blue Mountains from the Snake River to the Columbia River in August of 1833. During that journey, they encountered "forest fires as fierce as any we have nowadays but no pen has pictured the fire demon any more effectively than did Washington Irving." The quotes are extremely detailed and evocative, with extensive references to both fire and smoke conditions. They also refer to landmarks such as Gun Creek, Ice River (sometimes called the Grand Rond), and the headwaters of the Grand Rond where the "Skynses" pastured their horses as well as to banquet upon the salmon which abound in the neighboring waters.
Keywords: Fire history/Forest fires/Historical document/Blue Mountains/Northeastern Oregon/Grande Ronde River/American Indians/Salmon.

835. **U.S. Department of Agriculture, Forest Service**. **1913**. Memorandum of general extent of insect infested areas on the various forests of District 6. Unpublished Typescript Memorandum. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, District 6. 12 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This memorandum provides comments about insect infestations for each of the national forests in District (Region) 6. For the Malheur NF, it notes that a 1910 report showed that much lodgepole and considerable yellow pine over much of the Forest has been and was continuing to be killed by bark beetles. Conditions in 1912 were reported to be much the same as in 1910. For the Umatilla NF, heavy attacks in lodgepole pine were occurring in T. 3 S., R. 33 E. and T. 5 S., R. 33 E. (North Fork John Day Ranger District, Camas Creek watershed), with severe attacks occurring in T. 4 and 5 S., R. 29 E. (NFJD District, Western Route area). A belt of infested lodgepole and yellow (ponderosa) pine ranged from T. 6 S., R. 29 E. to T. 6 S., R. 27 E. (NFJD and Heppner Districts). A large bark beetle outbreak occurred in yellow pine in sections 19-20 in T. 7 S., R. 25 E. and sections 19-29 in T. 7 S., R. 24 E. (Heppner RD, ranging from Davis Creek on the east to Alder Creek and south of Wheeler Point on the west). On the Wallowa NF, it was reported that very little insect work was done during 1912 and it appeared that the beetles had ceased working on both the Wallowa and Minam NFs. However, there was still an active infestation in lodgepole pine, and a particularly severe infestation in whitebark pine at higher elevations around Wallowa Lake. On the Whitman NF, bark beetle infestations were widespread. Bark beetle attacks had first been noticed on that Forest in 1906; by 1912, an outbreak was almost general throughout the entire lodgepole and yellow pine types on the northern end of the Forest (300,000 to 400,000 acres). Control efforts were begun in the fall of 1910 and continued in 1911 and beyond (see Edmonston's report in the history archives for more information about that outbreak). It was reported that the area was almost as badly infested as when control efforts began, but that the spread of beetles to-

ward the southwest had been checked and that the infestation was finally starting to decline. For the Wenaha NF in Washington, it was noted that occasional yellow and lodgepole pines were being killed throughout the Forest, but there were no infested areas of any importance.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa NF/Whitman NF/Malheur NF/Umatilla NF/Wenaha NF/North Fork John Day RD/Heppner RD.

836. **U.S. Department of Agriculture, Forest Service**. **1913-1917**. Miscellaneous memoranda and reports regarding exotic tree plantings on the Umatilla National Forest. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 5 p. **Notes**: A photocopy of an original.
Abstract: This accession consists of a typescript memorandum and two types of forms or reports: first report on plantations or seeding areas (form 134), and progress report on plantations or seeding areas (form 135). The documents in this accession pertain to three exotic species that were planted near the Dixon Ranger Station on the Umatilla National Forest. The first report describes plantings of black locust, honey locust, and box elder on March 15, 1912. The planting site was described as being at 3,600 feet elevation, on a west exposure and with red, adobe clay soils. The site had open grass cover dominated by timothy and blue grass. Planting was completed with a shovel at a spacing of 24 feet. Only 8 trees were planted. No planting cost was shown because the Ranger's wife did the planting while Ranger Dixon was in Heppner, working on the Heppner-Ukiah telephone line. The planting area was in the yard at the Dixon Ranger Station. When the plantings were reported on December 31, 1913, it was found that 62.5% of the trees had survived, with the reason for the losses being given as drought. The trees that did not survive were one black locust and two honey locust, with the box elder being "extra fine" and no doubt doing well. Survival was still the same at the time of the next report on June 30, 1914. By the last report on July 18, 1917, none of the trees were shown as having survived and Dixon stated that "it has been demonstrated that none of the above named species will grow in this locality" and he recommended that the experiment be closed.
Keywords: Artificial regeneration/Heppner RD/Historical document/Tree planting/Spot seeding/Umatilla NF/Honey locust/Black locust/Box elder/Exotic species.

837. **U.S. Department of Agriculture, Forest Service**. **1910-1951**. Miscellaneous memoranda and reports regarding exotic tree plantings on the Wenaha National Forest. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 24 p. **Notes**: A photocopy of an original.
Abstract: This accession consists of typescript memoranda and two types of forms or reports: progress report on hardwood experiments, and progress report on plantations or seeding areas (form 135). The documents in this accession pertain to a variety of exotic species that were planted near Ranger Stations or Guard Stations on the Wenaha National Forest, which is now the Pomeroy and Walla Walla Ranger Districts of the Umatilla National Forest. The earliest memoranda and reports describe plantings of red oak, pignut hickory, shagbark hickory, and black walnut at the Tucannon and Corporation Ranger Stations on May 2 and May 5, 1910. When the Corporation plantings were examined on November 10, 1910, it was found that none of the trees had survived, with the reason for the poor survival being given as the extremely hot, dry growing season of 1910. The Tucannon planting actually had some survival, with about 50% of the red oak, 70% of the pignut, 0% of the shagbark, and 10% of the walnut surviving at the end of the first growing season. The reason for the losses at the Tucannon site were given as the poor condition of the planting stock (which appeared to have been frozen during shipping) and the extremely dry growing season. When W. H. Kendall examined the Tucannon plantings, he recommended that any future plantings occur in the fall and not later than the middle of October so that the soil could settle around the roots during the winter – the trees would be less susceptible to drying out during the ensuing spring and summer growing season. Reports and maps showing seeding trials of black locust, completed from April 12-14 and April 25-26, 1911, at the Tucannon and Iron Springs Ranger Stations are also included. Examinations completed by Assistant Ranger A. J. Graden during the fall of 1911 showed that the locust seeds sprouted well at Iron Springs but were bitten off by rabbits and other "varmints" during August and September, but that very few seeds sprouted at the Tucannon site. In May of 1912, 35 black locust and 20 honey locust were hand planted at the Tucannon Ranger Station. By the fall of 1915, only a third of the trees were alive, with the losses caused by gophers and drought. The honey locust had not done well, although surviving black locust were growing well and were healthy. By October of 1917, the surviving black locust were shown as four feet tall and the planting was termed "a success." At the Dry Gulch Ranger Station, 25 black locust and 25 box elders were planted in May of 1912. By June of 1915, only 25% of the trees were still alive, with the losses attributed to girdling by borers. Of particular interest is a memorandum dated December 13, 1941 by G. J. Tucker, District Ranger of the Pomeroy Ranger District, which describes his examination of 20 surviving black locust trees at the Dry Gulch Ranger Station. At that time, diameters (measured at an 18" stump height) ranged from 2 inches to 18 inches, and heights from 10 feet to 32 feet. Tucker could find no box elder trees at the Dry Gulch station. Tucker's memorandum also includes a hand-drawn map showing the location of

the 20 trees he measured. The last memorandum, dated March 20, 1951, is from the Pomeroy District Ranger to the Forest Supervisor. In it, the Ranger asks why a report on the Tucannon planting is needed (a report had been scheduled every 10 years) since it had been well established that black locust would grow in the area; therefore, they would not provide a report unless asked to do so by the Forest Supervisor before April 15th.
Keywords: Artificial regeneration/Pomeroy RD/Historical document/Tree planting/Spot seeding/Walla Walla RD/ Wenaha NF/Iron Springs Ranger Station/Tucannon Ranger Station/Dry Gulch Ranger Station/Corporation Ranger Station/Red oak/Pignut hickory/Shagbark hickory/Black walnut/Honey locust/Black locust/Box elder/Exotic species.

838. **U.S. Department of Agriculture, Forest Service**. **1913-1915**. Miscellaneous memoranda and reports regarding ponderosa pine plantations in the Kahler Creek area. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 17 p. **Notes**: A photocopy of an original.
Abstract: This item consists of typescript memoranda and two types of forms or reports: first report on plantations or seeding areas (form 134), and progress report on plantations or seeding areas (form 135). The documents in this accession pertain to ponderosa pine plantations established in the Kahler Creek area on what is now the Heppner Ranger District. The first reports on this project were completed by Assistant Forest Ranger Peter A. Dixon in August of 1913. They describe a planting and seeding trial that was established in May of that year; it was referred to as "Kahler Creek No. 2." The planting trial consisted of shovel planting 50 bare-root ponderosa pine seedlings at a 16-foot spacing on May 6, 1913; the seedlings were grown at the Wind River nursery in southern Washington and the provenance of the seed was the Boise National Forest (so much for the concept of using seed from local, well-adapted sources). Site conditions for both the planting and seeding trials were described as: approximately 3700' elevation, south exposure, sandy loam soil, and open grass and scattered sagebrush on a scabland with very light vegetative cover and no evidence of recent burns. The weather conditions were described as rainy at the time of planting. It stated that stakes were driven in the ground to protect the trees (protection from what is not known). The objective of the planting was to see if trees could be grown on scablands by transplanting them there. The total cost of the planting was shown as $5.02, of which $0.29 was for trees, $2.50 for site preparation, $0.73 for surveying, and $1.50 for the planting operation. The cost of the trees was shown as $5.74 per thousand. The seeding trial consisted of putting out tree seeds in 50 hills (small mounds) that were protected with wire screens, and in 50 hills that were unprotected. The seeding occurred on May 16, 1913, when it was also rainy. The objective was to see if trees could be grown from seed on scablands. The spots or hills were spaced 16 feet apart, which was also the same spacing that was used when planting the tree seedlings. The report shows that ½ pound of seed was used on 3/5 of an acre; the cost of the seed was $0.30 per pound. The cost of the seeding was actually more than the planting, ranging from $10.49 to $17.48 depending on how much seed was used and whether the wire screens were employed for protection (from rodents?). The balance of these documents are progress reports and memoranda discussing the planting and seeding results. For example, a progress report based on an examination of the seeded area on June 29, 1913 showed that the seed had not germinated by then and that Dixon believed it was a failure because the seed had been put out too late to catch the early spring rains. By the progress report of July 3, 1914, there was still no germination and Dixon recommended that the area be reseeded the following spring and no later than April 1st. The 7/3/14 progress report for the planting trial showed that 50% of the seedlings were surviving, and that the losses were due to livestock damage. Although Dixon felt that this trial was a success and had demonstrated that trees can be grown from nursery transplants, he recommended that the work (planting) be discontinued in his District because natural reproduction was "very great."
Keywords: Artificial regeneration/Heppner RD/Historical document/Natural regeneration/Tree planting/Livestock damage/Spot seeding/Kahler Creek/Boise NF/Umatilla NF.

839. **U.S. Department of Agriculture, Forest Service**. **1913-1915**. Miscellaneous memoranda and reports regarding ponderosa pine plantations in the Henry Creek area. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 26 p. **Notes**: A photocopy of an original.
Abstract: This item consists of typescript memoranda and two types of forms or reports: first report on plantations or seeding areas (form 134), and progress report on plantations or seeding areas (form 135). The documents in this accession pertain to ponderosa pine plantations established in the Henry Creek area on what is now the Heppner Ranger District. The first reports on this project were completed by Assistant Forest Ranger Peter A. Dixon in August of 1913. They describe a planting and seeding trial that was established in May of that year; it was referred to as "Henry Creek No. 1." The planting trial consisted of shovel planting 50 bare-root ponderosa pine seedlings at a 16-foot spacing on May 5, 1913; the seedlings were grown at the Wind River nursery in southern Washington and the provenance of the seed used to grow the seedlings was the Boise National Forest (so much for the concept of using local, well-adapted seed sources). Site conditions for both the planting and seeding trials were described as: approximately 3700' elevation, southeast exposure, sandy loam soil, and open grass and juniper on a very old burn.

The weather conditions were described as rainy at the time of planting. The objective of the planting was to see if trees could be grown on scablands by transplanting them there. The total cost of the planting was shown as $5.02, of which $0.29 was for trees, $2.50 for site preparation, $0.73 for surveying, and $1.50 for the planting operation. The cost of the trees was shown as $5.74 per thousand. The seeding trial consisted of putting out tree seeds in 50 hills (small mounds) that were protected with wire screens, and in 50 hills that were unprotected. The seeding occurred on May 15, 1913, when it was also rainy. The objective was to see if trees could be grown from seed on scablands. The spots or hills were spaced 16 feet apart, the same spacing used for the tree planting. The report shows that ½ pound of seed was used on 3/5 of an acre; the cost of the seed was $0.30 per pound. The cost of the seeding was actually more than the planting, ranging from $10.49 to $17.48 depending on how much seed was used and whether the wire screens were employed for protection (from rodents?). The balance of these documents are progress reports and memoranda discussing the planting and seeding results. For example, a progress report based on an examination of the seeded area on August 17, 1913 showed that the seed had not germinated by then and that Dixon believed it was a failure because the seed had been put out too late to catch the early spring rains. By the progress report of July 2, 1914, there was still no germination and Dixon recommended that the area not be reseeded the following spring because the area had abundant natural regeneration. The 8/17/13 progress report for the planting trial showed that 100% of the seedlings were surviving, and that the project could be considered a success. Note that there is also a copy of the Annual Planting Report for the Umatilla NF (dated January 1, 1915) in which Forest Supervisor W. W. Cryder states: "I know of no areas in the Forest in need of reforestation. The Forest is very generally reforesting itself. There are some open ridges on which the soil is probably too shallow for tree growth, but on others I find a good stand of yellow pine reproduction, showing that where conditions are at all favorable tree growth is advancing. Stockmen of long experience in these mountains tell me that the reproduction is rapidly changing the looks of the country and that where twenty-five years ago there were open spots or prairies there are now dense thickets, lodgepole, of course, playing a prominent part in this natural reproduction, but the reproduction of the more valuable species is abundant. In view of this excellent natural reproduction I do not recommend the use of artificial methods."
Keywords: Artificial regeneration/Heppner RD/Historical document/Natural regeneration/Tree planting/Livestock damage/Spot seeding/Henry Creek/Boise NF/Umatilla NF.

840. **U.S. Department of Agriculture, Forest Service**. **1938**. Miscellaneous memoranda regarding a timber sale award appeal, Camas Creek unit. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 93 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This item consists of a series of memoranda, testimonials, petitions, and related correspondence about a timber sale award appeal for the Camas Creek unit, a timber sale containing 221,308,000 board feet of national forest timber located on the Umatilla National Forest. The sale area comprised an area of about 69,645 acres in townships 3, 4, 5, and 6 south, ranges 32, 33, 33½, and 34 east of the Willamette Meridian. It was located in the watersheds of Camas and Meadow Creeks, with the western boundary of the unit being about 10 miles east of Ukiah, Oregon. Timber on the unit consisted of a mixed stand of ponderosa pine, Douglas-fir, western larch, lodgepole pine and other species. All of the advertised volume was ponderosa pine; cutting of the other species was optional with the purchaser. The appraisal report indicates that the timber sale and prospectus were the result of an application by the Mt. Emily Lumber Company of La Grande, Oregon (dated March 4, 1937) that requested "the remaining National Forest saw timber within the Camas Creek Block of the Umatilla National Forest." As a result of their request, a meeting was held in Burns, Oregon on June 3rd which was attended by a representative from the Washington Office of the Forest Service (E. E. Carter), the Regional Forester of Region 6 (C. J. Buck), two other representatives from the Regional Office, and several representatives of the Mt. Emily Lumber Company. The meeting resulted in the preparation and advertising of a prospectus for a new timber sale. The Mt. Emily Lumber Company was formed principally by the Stange and Kinzel families, successful lumber operators from Wisconsin. They made heavy investments in the Grande Ronde Working Circle in 1912 and 1913. In 1925, they constructed a modern, 3-band sawmill and drying facility, along with a complete remanufacturing and fininshing plant, at La Grande, Oregon. The rated capacity of their sawmill and associated operations was 50 million board feet per year. At the time of the appraisal report, the Mt. Emily Lumber Company had been operating in the Working Circle for 8½ years, with about half of the volume coming off their own lands and the remainder from national forest lands located east of this proposed sale. After the sale was finally advertised in the fall of 1937, the highest bidder turned out to be the Milton Box Company of Milton, Oregon, who outbid the Mt. Emily Lumber Company by $0.16 per thousand board feet. The sale was awarded to Milton Box Company, which resulted in a storm of protest and an extremely controversial situation. Most of the items in this accession are memos, letters, or petitions prepared by local businessman and civic leaders describing the importance of the Mt. Emily Lumber Company to the tax base and economy of La Grande, Oregon, the Grande Ronde Valley, and northeastern Oregon. [Note: for information about the Camas

Creek prospectus and timber sale appraisal report, see George E. Stevenson's "Sale prospectus and timber appraisal report; Camas Creet Unit" for more information.]
Keywords: Blue Mountains/Historical document/Umatilla NF/Timber sales/Camas Creek/Mt. Emily Lumber Company/North Fork John Day RD/Milton Box Company.

841. **U.S. Department of Agriculture, Forest Service**. **1952**. Miscellaneous memoranda regarding a timber sale bid protest, Umatilla National Forest. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 59 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a series of memoranda dealing with a bid protest for a timber sale in the Enbanks area of the Umatilla National Forest, which is located on the North Fork John Day Ranger District. The prospectus required that the purchaser of the timber carry public liability insurance for personal injury in the amount of $500,000 and property damage insurance in the amount of $50,000, and that the insurance must be satisfactory to the Pilot Rock Lumber Company because they held an easement on the road that the timber would be hauled on (the North Fork John Day road) under the proposed contract. One of the bidders for the timber was Mr. Frank Moore from Ukiah, who often provided logs for the Harris Pine Mills Company in Pendleton, Oregon. Harris filed a formal protest with Forest Supervisor C. M. Rector on September 14, 1952, stating that the insurance and right-of-use collection requirements in the prospectus as related to the North Fork John Day road were prejudicial to the Pilot Rock Lumber Company and provided them with an unfair advantage over other bidders. Many of the memoranda in this accession are from Mr. William W. Wells, attorney at law and representing the interests of Harris Pine Mills. Attorney Wells wrote to United States Senator Wayne Morse and asked him to investigate the matter. Morse then wrote to the Chief of the Forest Service, which resulted in much correspondence between the Chief (Richard E. McArdle at that time) and the Regional Forester in Portland (J. Herbert Stone), and between Stone and the Umatilla National Forest Supervisor (C. M. Rector). The memoranda in this accession span a period of time from June 30, 1952 (a memo to the files) and November 13, 1952, although most of the material is dated in September and October of 1952.
Keywords: Historical document/North Fork John Day RD/Timber sales/Umatilla NF/Timber sale bid protest.

842. **U.S. Department of Agriculture, Forest Service**. **1931**. Miscellaneous memoranda regarding timber survey projects in District 6. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 5 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of two memoranda – a four-page memorandum from the North Pacific District (Region 6) to the Forester (Chief) in Washington, DC, and a one-page memorandum from the Assistant Forester (Chief) to the Regional Forester in Portland, Oregon. In the longer memo to the Forester, Regional Forester C. J. Buck describes the timber survey program for Region 6 as it existed during fiscal year 1930, and the plans or schedule for upcoming surveys during fiscal years 1931 to 1933. During the 1930 field season, the planned schedule had been changed because it was necessary to cover 54,400 acres of unplanned projects on the Ochoco and Umatilla National Forests. During 1930, timber survey projects had been completed on the Ochoco (Mill Creek), Olympic, Malheur (Middle Fork John Day River), Whitman (Middle Fork John Day River), and Umatilla (Camas Creek) National Forests. The memo also states that the $2,600 balance of the 1931 allotment for timber surveys was urgently needed to continue work on the Camas Creek and Skagit projects. The memo then lays out a proposed schedule for timber surveys for fiscal years 1932 through 1934. The 1932 project list includes continued work on Camas Creek on the Umatilla NF. The 1933 list includes Bear Creek on the Malheur NF and Rock Creek on the Umatilla NF. The reason that a survey was initiated on Camas Creek in 1930 was that the Mt. Emily Lumber Company had applied for a timber sale in that area. The requested 1931 allotment would complete the portion of the Camas Creek survey that was needed to respond to Mt. Emily's timber sale application. The proposal for a Rock Creek project was tied to the Kinzua Lumber Company's work in that area on their own lands; they contemplated entering the adjacent national forest lands within a few years.
Keywords: Forest inventory/Historical document/Umatilla NF/Pacific Northwest Region/Timber surveys/Kinzua Lumber Company/Malheur NF/Camas Creek/Rock Creek/Mt. Emily Lumber Company.

843. **U.S. Department of Agriculture, Forest Service**. **1923**. Miscellaneous memoranda regarding timber surveys in District 6. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service. 16 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of two long memoranda prepared by Thornton T. Munger and A. H. Hodgson, and several shorter memoranda that served as transmittal letters with the longer memoranda as enclosures. Their

memoranda reference a "Cooley Conference Timber Surveys Committee" that apparently dealt with timber survey methods and had a contentious discussion about the necessity of preparing topographic maps when completing timber surveys. The discussion apparently dealt with the financial reasonableness of preparing contour (topographic) maps in country where the terrain was not rugged or broken. Since topographic mapping was expensive, it was felt that more survey (cruise) work could be completed if contour maps were only prepared when absolutely necessary, i.e., for rough, rugged country where logging systems planning would justify the added expense of preparing one. Munger did not agree with that position and believed that topographic mapping was an essential tool for general forest management, not just timber surveys. As such, he felt that the variety of uses for a topographic map was ample justification for the relatively high initial cost to prepare one. Hodgson's memorandum has much the same tone as Munger's. An interesting table in Hodgson's memorandum shows the acreage of topographic mapping that had been completed by private timber companies for their holdings. For the vicinity of the Umatilla National Forest, it shows that Palmer Lumber Company had completed topographic mapping (at a 20' contour interval) on about 80,000 acres, and that the Mt. Emily Lumber Company had completed such mapping (at a 100' contour interval) on about 132,000 acres.
Keywords: Forest inventory/Historical document/Umatilla NF/Timber surveys.

844. **U.S. Department of Agriculture, Forest Service**. **1940**. National forest scaling handbook. Unnumbered Published Handbook. Washington, DC: United States Government Printing Office. 119 p. **Size**: 5" x 8".
Notes: An original copy.
Abstract: This accession is an early handbook that was used by those who scaled national forest timber (scaling refers to measurement of cut timber in order to determine payment amounts due the owner of the stumpage). It includes the following sections: scaling and measurement of national-forest timber; policy; scaling logs; determining the merchantability of logs; scaling green and dead timber; penalty scale; scaling from the stump; tree measurement instead of log scale; scaling logs by International ¼-inch log rule; cubic measurements; linear measurements; counting; weighing; records and reports; and appendix.
Keywords: Timber sales/Historical document/Timber measurements/Timber scaling.

845. **U.S. Department of Agriculture, Forest Service**. **1964**. Operation bugout. Unnumbered Quad-fold Brochure. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Intermountain Region, Salmon National Forest. 8 p. **Size**: 4" x 9". **Notes**: An original copy.
Abstract: This accession is a brochure that explains a project designed to control populations of western spruce budworm that were defoliating mixed-conifer stands on the Salmon-Challis National Forests of south-central Idaho. It was proposed to treat about 500,000 acres in 1964 with a chemical insecticide called DDT, which represented about a third of the defoliated area of 1,500,000 acres. The brochure includes the following sections: forest destruction, a serious economic problem in Idaho; the spruce budworm; why this must be done...now; facts about the spray operation (objectives, duration, safety and spraying); what's at stake; you and the spray; is there danger to you?; protecting wildlife; the spruce budworm, including a life cycle chart for the insect; cooperation; operating personnel; and a small-scale map showing the national forests, control areas, air bases, test area, and expansion areas.
Keywords: Insect damage/Western spruce budworm/Insect control/Chemical insecticides/DDT/Historical document/Southern Idaho/Salmon NF/Challis NF.

846. **U.S. Department of Agriculture, Forest Service**. **1977**. Permanent insect or disease study plots on national forest lands. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 78 p. **Notes**: An original copy.
Abstract: As a result of a 1976 review of forest pathology programs by Forest Insect and Disease Management and Forest Disease Research, a recommendation was made to compile a listing of permanent plots (defined as those 2 years old or more) located on federally administered lands. This report provides a description and location of permanent insect and disease evaluation plots as submitted by Oregon State University, U.S. Forest Service – Pacific Northwest Research Station, and U.S. Forest Service – Pacific Northwest Region. The plot listing was compiled in order to meet three objectives: protect them from unintentional disruption by man; to inform land managers about their existence and location; and to provide opportunities for investigators to share information from each other's plots. Approximately a dozen of the plots in the listing are located on the Umatilla NF; many of them were established to monitor effects of the early-1970s tussock moth outbreak, and the late-1970s mountain pine beetle outbreak.
Keywords: Insect surveys/Disease surveys/Douglas-fir tussock moth/Insects/Tree diseases/Mountain pine beetle/Umatilla NF.

847. **U.S. Department of Agriculture, Forest Service**. **1957**. Plot procedure and forest type classification. Unnum-

bered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 37 p. **Size**: 6” x 9”. **Notes**: Copied 2 pages side by side on 8½” x 11” paper.
Abstract: This is a typescript report that describes the codes and establishment procedures to be used with forest inventory plots established during the 1957 field season. Most of the document is a list of codes with detailed descriptions of what the codes mean and how the measurements should be collected.
Keywords: Forest inventory/Forest measurements/Historical document/Tree measurements.

848. **U.S. Department of Agriculture, Forest Service**. **1940**. The principal laws relating to the establishment and administration of the national forests and to other Forest Service activities. Miscellaneous Publication No. 135. Washington, DC: U.S. Department of Agriculture. 40 p. **Size**: 6” x 9”.
Notes: An original copy. Issued in January, 1932, revised in January, 1939, and slightly revised in October, 1940.
Abstract: This publication describes laws governing the administration and organization of the national forests and their administrator: the U.S. Forest Service. It includes the following sections: establishment; jurisdiction; occupancy and use; fiscal matters; Weeks law and amendments; Clarke-McNary Act; McSweeney-McNary Act; Civilian Conservation Corps; and Flood Control Survey Act.
Keywords: Forest administration/Historical document/National forests.

849. **U.S. Department of Agriculture, Forest Service**, **1940**. Proceedings of range research seminar. Ephraim, Utah. Unnumbered Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 414 p. **Notes**: An original copy.
Abstract: These are the proceedings from a symposium held at the Great Basin Branch Station of the Intermountain Forest and Range Experiment Station. The format of the symposium was to have formal papers presented, followed by floor discussions participated in by the entire group. Committees were also formed; committee reports, which are also included in this volume, provide a synopsis of the papers, summarize additional points raised during the floor discussions, and present the committees’ recommendations. The following papers are included in this proceedings: looking ahead; what we have learned from past research; present and future needs; analyzing regional problems for developing a program; individual problem or project analysis; selecting the experimental range; working plans; experimental designs applicable to range research; problems in the growth of the plant itself; climatic factors and their relationships; soil in relation to other site factors; measuring the annual forage crop; fundamental concepts; ocular methods for recording vegetation; intensive methods of measuring vegetation; enclosures and temporary fenced plots; utilization standards and degree of use studies; season of use studies; clipping in contrast to grazing; undesirable plants; special problems in the use of animals; handling livestock on the range; animal nutrition studies; artificial revegetation; standardization; publications; station integration; cooperation with other research agencies; grazing capacity; grazing and wildlife relationships; grazing and watershed management; grazing and western timber production; grazing and recreation; range economics; getting range research results into practice; report of committee no. 15; and attendance roster.
Keywords: Cattle grazing/Grazing/Grazing damage/Great Basin Range Experiment Station/Historical document/Livestock forage/Range history/Range management/Sheep grazing.

850. **U.S. Department of Agriculture, Forest Service**. **1953**. Range reseeding projects; Umatilla National Forest; 1938-1952. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 2 p. **Notes**: A photocopy of an original.
Abstract: This short accession consists of a two-page table summarizing range reseeding projects that occurred on the Umatilla National Forest between 1938 and 1952. It provides the following information for each project: year; project name; and acres by method (plow and/or drill, or broadcast). The table includes a total of 72 projects, which involved 742.1 acres of plowing and/or drilling, and 3,294.7 acres of broadcast seeding.
Keywords: Historical document/Range management/Umatilla NF/Range seeding.

851. **U.S. Department of Agriculture, Forest Service**. **1910**. Reconnaissance reports; District 4. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 10 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report provides an outline for completing reconnaissance reports in District (Region) 4 of the Forest Service. It begins with the following admonitions: reports should be concise and to the point; avoid long sentences and all information not of use; remember that reports should be technical – not popular; and accompany each report with a statement showing time field work was done, personnel of party, cost and scope of work, and period to be covered by report. The balance of this document is an outline explaining what should be included in reconnaissance reports, including blank tables that were included as examples. The reconnaissance reports were to include the following chapters: introduction; the forest; lumbering; forest management; and forest estimate (summarized in ta-

bles). They were also supposed to include stand tables representative of the various types and conditions found on the Forest. Each report was to be accompanied by a map showing the most striking features and factors influencing management. Its scale was to be no less than 2 inches to the mile. When possible, the maps were supposed to show topography, and the location of towns, stations, telephone lines, existing roads, and streams, whether drivable or not. Classification of lands into three broad categories was required: actual forest land; potential forest land; and non-forest land. The document also provides symbols that were meant to be used with the maps, such as symbols for timber that was too expensive to log at present, insect infested areas, burns, cut-over areas, etc. Symbols were also provided for denoting silvicultural opportunities and reforestation needs.
Keywords: Forest inventory/Forest mapping/Historical document/Land classification.

852. **U.S. Department of Agriculture, Forest Service**. **1965**. Reforestation handbook. FSH Handbook 2409.26b R6. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p.
Notes: An original copy. Issued in increments between March, 1965 and March, 1985.
Abstract: This is a standard Forest Service Handbook issued by the Pacific Northwest Region. It contains the following chapters: introduction; reforestation surveys and plans; site preparation (incomplete); field seeding; field planting; and plantation protection. This copy of the handbook also contains two old Umatilla supplements signed by Wright T. Mallory, Forest Supervisor at the time. Umatilla supplement no. 1, dated July 2, 1965, describes procedures for making survival checks on reforestation plantings on the Forest; Umatilla supplement no. 19, which pertains to section 2468.5 of the Forest Service Manual, describes procedures to follow when preparing and using the Reforestation and TSI Plan and Record (form 2460-159).
Keywords: Artificial regeneration/Broadcast seeding/Pacific Northwest Region/Planting/Site preparation/Plantation protection.

853. **U.S. Department of Agriculture, Forest Service**. **1911**. Report of offices in District Office, District 6. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 241 p. **Notes**: A digital version of this report is available; filename: 1911Rep2. Photocopy from an original located at the Pacific NW Region of the National Archives in Seattle, WA.
Abstract: This report describes the programs and status of District 6 for fiscal year 1911. The following topics are covered: public sentiment, education, ranger schools, Supervisor and Ranger meetings, information, water power, stream measurements, forest management, lands, forest fires, permanent improvements, range management, game, and a variety of others.
Keywords: Program administration/Historical document/Pacific Northwest Region/Oregon/Washington.

854. **U.S. Department of Agriculture, Forest Service**. **1949**. Report on microfilm project in the National Archives, March, 1949. Unpublished Typescript Report. [Place of publication unknown]: [Publisher unknown]. 19 p.
Notes: A photocopy of an original.
Abstract: This typescript report describes a project where the Forest Service writer went to the National Archives and used a Graflex Photorecord camera to microphotograph material pertaining to the history of the Pacific Northwest. The writer photographed material between March 1 and March 24, 1949. In general, the material was taken from a prepared list but in some instances items appearing on the list were bypassed and other items added. The project was intended as a prototype for future efforts to document Forest Service research material in the National Archives. This report includes the following sections: introduction; type and operation of equipment; files microfilmed; files ordered from the National Archives; and conclusions and recommendations. The last 14 pages of this report represent a fairly detailed inventory of the documents that were photographed, organized by items, folders, and documents. The roll number is also shown for groups of items and folders. The location of each document (drawer and accession numbers from the National Archives) are provided for each item group. Most of the documents photographed came from the Research Compilation File section in the Archives.
Keywords: Historical document/National Archives/Research Compilation File/Reference list/U.S. Forest Service history.

855. **U.S. Department of Agriculture, Forest Service**. **1916**. Sale prospectus: 124,000,000 feet, western yellow pine and other species, lower Middle Fork John Day River unit, Whitman National Forest, Oregon. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, District Forester. 18 p.
Notes: An original copy.
Abstract: This prospectus was issued for the first timber sale arising from a detailed examination of three watersheds in the Middle Fork John Day River in the Whitman NF (now Malheur NF). A report of that examination is also present in the library (see Andrews and Merritt 1910). This prospectus covers the following items: area and location, accessibility, volume estimates, area reserved from advertisement, timber quality, logging conditions, log-

ging costs, investment required, market conditions, general information, timber to be cut, and requirements for a financial statement. The majority of this document consists of a sample contract similar to that which the successful purchaser would be required to sign. A small-scale map of the timber sale area (general location only) is also provided.
Keywords: Historical document/Timber sales/Malheur NF/John Day River/Whitman NF.

856. **U.S. Department of Agriculture, Forest Service**. **1912**. Sales policy. Unpublished Typescript Memorandum. [Washington, DC]: [U.S. Department of Agriculture, Forest Service]. 40 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is a long memorandum issued by the Forester (Chief) of the U.S. Forest Service to a District (Regional) Forester. The Forester states that "I am now prepared to standardize more definitely than has yet been done the policy and practice of the Forest Service as regards large timber sales. In this connection, it is desirable also to discuss certain special contract clauses supplementing those given in the timber sales Manual. It is the purpose of this letter to bring these matters together in one place for your consideration and reference." The memorandum includes these sections: amount of timber and time limits; readjustment of stumpage rates; minimum cut requirements; logging improvements; brush disposal; administration; control of methods of logging; special rates for small material which it is found practicable to utilize during the life of the contract; control of railroads; snags and diseased trees; maintenance of existing improvements; sanitary conditions on sale area; reservation of turpentine rights; specific statement of amount of timber to be reserved in marking; inspection of purchaser's books; definition of merchantable log; stumpage appraisals; sales to companies owning large bodies of timber; advertisement; and bonds and deposits.
Keywords: Historical document/Timber sales.

857. **U.S. Department of Agriculture, Forest Service**. **1935**. Sample plots in silvicultural research. Circular No. 333. Washington, DC: U.S. Department of Agriculture. 90 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This detailed circular describes the process that was involved in establishing sample plots for silvicultural research, including a discussion of these topics: types of sample plots; qualifications of the investigator; study plan; number and distribution of plots; size and shape of plots and subplots; use of isolation strips; plot establishment, including stand selection, plot location and numbering, and mapping; individual tree numbering and control; plot protection; collection of plot information; report preparation and maintenance of office records; and plot abandonment. Appendix material provides typical field forms used by the USFS; instrumentation used for silvicultural research; abbreviations, symbols and numeric codes used in sample-plot work; and methods in use for preparing volume tables.
Keywords: Sampling/Research methods/Forest inventory/Historical document.

858. **U.S. Department of Agriculture, Forest Service**. **1921**. Sample range appraisal vegetative types east of the Cascade Mountains in Oregon and Washington. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, District 6. 15 p. **Notes**: An original copy.
Abstract: This is a short report bound in a standard, 2-post hardboard cover (shown as a Form 406 on the front cover). It includes of a table showing the vegetative type numbers, subtype identifiers, and a type discussion or narrative. The bulk of the report consists of high-quality, black-and-white photographs that illustrate the various vegetative types. Although each photo includes the standard 6-digit negative number in the lower right-hand corner, it is unfortunate that no other location information is provided that would help tie the photos to a National Forest or Ranger District.
Keywords: Historical document/Range management/Land classification/Pacific Northwest Region/Vegetation classification/Range mapping.

859. **U.S. Department of Agriculture, Forest Service**. **1973**. Silvicultural examination and prescription handbook. FSH Handbook 2409.26d R6. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p. **Notes**: An original copy. Issued in increments between September, 1973 and January, 1985.
Abstract: This is a standard Forest Service Handbook issued by the Pacific Northwest Region. It contains the following chapters: silvicultural objectives; stand diagnosis and prescriptions; stand examination; explanation of stocking level curves, managed yield tables, site class, and site productivity; and appendix.
Keywords: Pacific Northwest Region/Forest inventory/Forest measurements/Silviculture/Stand diagnosis/Silvicultural prescriptions/Stand examination/Stocking-level curves/Stand density.

860. **U.S. Department of Agriculture, Forest Service**. **1973**. Spray tests seek anti-tussock moth weapon. Greensheet.

1612: 1-3. **Notes**: An original copy.
Abstract: This article describes experimental insecticide applications that were made during a Douglas-fir tussock moth outbreak that affected the Blue Mountains in the early 1970s. The test sprays occurred on and around the Umatilla and Wallowa-Whitman National Forests. The objective of the tests was to find a suitable substitute for DDT, which had previously been found to be effective against DFTM but was banned in 1972. Zectran was being used on about 41,000 acres; carbaryl (Sevin-4 Oil) on about 1,500 acres; and Dylox (trichlorfon) on about 3,000 acres. Two biological control agents – *Bacillus thuringiensis* and a natural virus – were also being tested by the Pacific Northwest Forest and Range Experiment Station. The article also mentions that aerial application of Zectran was being expanded to include about 32,000 acres of the Walla Walla watershed on the Umatilla NF because an application to use DDT had been denied. Jack Mounts, an employee of the Region's Insect and Disease Control unit, was project director for these experimental applications.
Keywords: Blue Mountains/DDT/Douglas-fir tussock moth/Historical document/Insect control/Insect damage/Timber salvage/Umatilla NF/Chemical insecticides/Zectran/Bacillus thuringiensis/Carbaryl/Wallowa-Whitman NF.

861. **U.S. Department of Agriculture, Forest Service**. **1958**. Spruce budworm control, central Blue Mountains, Oregon. Unnumbered Tri-fold Brochure. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 6 p. **Size**: 4½" x 9½". **Notes**: An original copy.
Abstract: This accession is a brochure that explains a project designed to control populations of western spruce budworm that were defoliating mixed-conifer stands in the Blue Mountains of northeastern Oregon and southeastern Washington. It was proposed to treat about 820,000 acres in 1958. The goal of the project was: "we believe that only projects which achieve their objectives safely, efficiently, and at reasonable costs are done well. Our purpose is to control the spruce budworm with no lost-time accidents, no forest fires, no loss of wildlife, and no damage to equipment. The brochure includes the following sections: the insect; facts about the project (period of operation, wildlife protection, public precautions); cooperation; project personnel; contractors; safety; our goal; a diagram showing the life cycle of the spruce budworm *(Choristoneura fumiferana)*; and a map showing the areas to be treated. The map showed two control units: Baker (headquartered at the Baker airport), and John Day (headquartered at the John Day airport). The map shows that significant areas on the North Fork John Day Ranger District were included in the 1958 control project, ranging from the entire southeastern portion of the District near Granite almost to Dale and Ukiah on the northwestern end.
Keywords: Insect damage/Umatilla NF/Western spruce budworm/Blue Mountains/Insect control/Chemical insecticides/Malheur NF/DDT/Historical document/Wallowa-Whitman NF.

862. **U.S. Department of Agriculture, Forest Service**. **1974**. Stand examination field procedures. R-6 Amendment No. 6, Silvicultural Examination and Prescription Handbook, Chapter 40. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. Variable p. **Size**: 5" x 8".
Notes: An original copy (2).
Abstract: This handbook is a reduced version of chapter 40 of the Silvicultural Examination and Prescription Handbook. It was designed for use by field crews collecting stand examination information. At the time of this handbook, stand examinations required use of 3 forms: a stand examination plot card (tree measurements, etc.), a stand examination cover card #1 (TRI system data, form class data, location data such as Forest and District, and sampling data), and a stand examination cover card #2 (slope percent, aspect, fuel type, site condition, vegetation/undergrowth data, and remarks).
Keywords: Forest inventory/Forest measurements/Historical document/Tree measurements/Timber compartments/Pacific Northwest Region.

863. **U.S. Department of Agriculture, Forest Service**. **1956**. Summary of knowledge concerning management of lodgepole pine forests that may have application in the Pacific Northwest. R-NW. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 9 p.
Notes: This document was prepared for a meeting of the Region 6 Research Program Investigative Committee.
Abstract: This document provides a summary of research and observations pertaining primarily to the management of lodgepole pine forests. It is not intended to be an exhaustive review of the literature on lodgepole pine silviculture and no information concerning protection requirements or utilization was included. The following sections are contained in the report: silviculture; regeneration; relation to water supply; and mensuration.
Keywords: Historical document/Lodgepole pine/Forest management/Silvicultural systems.

864. **U.S. Department of Agriculture, Forest Service**. **1911**. Summary of seeding operations with coniferous species, District VI. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 19 p.

Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession includes selected portions from a larger work; only the portions pertaining to national forests in the Blue Mountains were photocopied. It describes seeding trials or studies that had been conducted in District (Region) 6 as of March 15, 1911. Each trial or study is described using the following items: designation (area name, etc.); location (township, range, section); site (aspect, elevation, soils, vegetation zone, general ground cover); date (of establishment?); area (acreage); species (tree species and source of the seed); method (sowing method or methods used and quantity of seed used); and results (short narrative of important or major results from the trial or study). Descriptions of seeding trials from the following forests are included in this accession: Wallowa Forest (11 areas); and Whitman Forest (3 areas). No seeding trials from the Umatilla NF, Malheur NF, or other Blue Mountain units were included in the original document. At the end of this item is a 6-page section entitled "Summary of Costs;" it was included because costs had been so variable that it was not possible to include them when describing individual trials or studies.
Keywords: Artificial regeneration/Direct seeding/Historical document/Seed predation/Pacific Northwest Region.

865. **U.S. Department of Agriculture, Forest Service**. **1906**. Thinning forest plantations. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 5 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: A forest plantation should be spaced and thinned in such a way that the desired class of material or product is produced most quickly and efficiently. Commonly, the ideal tree was considered to be one with a long, straight bole and a dense, compact crown. A short-boled tree with a loose, wide-spreading crown made a good shade tree, but did not produce good timber. To secure stands of ideal trees, the plantation should be spaced so that tree crowns will close up in about 5 to 10 years and completely shade the ground. Early crowding was considered necessary to make the young trees grow straight and tall. After the crowns close and the trees begin competing with each other, three crown classes resulted – thrifty trees with their crowns generally above the others were dominants; overtopped trees that fell hopelessly behind the others were suppressed; and trees that were not as tall as the dominants but with crowns that still receive some measure of light were intermediates. Any thinnings completed before the period of rapid juvenile height growth is completed should be confined entirely to the removal of suppressed and ill-formed trees. Retention of some of the suppressed and intermediate trees was considered important because they caused the dominant trees to have short crowns and thereby form long, clear boles. Thinning must also consider the tolerance of tree species in the stand, since the crowns of intolerant species must have access to full sunlight. Tolerance varied by species and by site, however, with many species becoming more intolerant with age and with intolerant species behaving more like tolerant ones when growing on rich, moist sites. The author ends this short report with 4 recommendations with regard to thinning operations: keep the stand dense until the period of rapid juvenile height growth is over; after the period of rapid height growth is over, thin lightly by removing some of the suppressed and intermediate trees to favor the best dominant trees; make allowances for relative tolerance, age, and site quality when thinning; and do not thin heavy enough to favor establishment of weeds in the stand, or to allow the soil to dry out or to increase the stand's risk of windfall.
Keywords: Historical document/Thinning/Crown closure/Silviculture/Shade tolerance/Crown classes.

866. **U.S. Department of Agriculture, Forest Service**. **1950**. Timber management handbook. Part V. Timber surveys. Unnumbered Handbook. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Division of Timber Management. Variable p. **Notes**: An original copy.
Abstract: This old handbook contains the following chapters: introduction; aerial photographs; some concepts of sampling theory; timber survey equipment; land surveys, control, mapping and area determination; tallying methods and volume tables; species names and forest types; stand structure, site quality, and log grades; intensive surveys for timber sales; and extensive surveys for timber management. It also contains numerous drawings and illustrations, and provides a very complete description of surveying, the public land survey system, and the General Land Office surveying program.
Keywords: Forest inventory/Forest management/Forest mapping/Forest measurements/Historical document/Timber sales.

867. **U.S. Department of Agriculture, Forest Service**. **1965**. Timber management plan inventory handbook. FSH Handbook 2409.21b R6. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p. **Notes**: An original copy. Issued in increments between January, 1965 and January, 1974.
Abstract: This is a standard Forest Service Handbook issued by the Pacific Northwest Region. It contains the following chapters: introduction; forest inventory project leader; field procedures for forest inventories; field instructions for integrated forest survey – timber management inventories; land classification; and forest type mapping in the Pacific Northwest Region. In particular, this handbook provides some good background material relating to for-

est inventories that utilized the 10-point, 1/5-acre plot design. Chapter 50 provides background material about mapping procedures for forest type maps of that era.
Keywords: Forest inventory/Forest mapping/Land use planning/Pacific Northwest Region.

868. **U.S. Department of Agriculture, Forest Service**. **1963**. Timber management plan, Umatilla National Forest, North and South Umatilla working circles, plan period 7/1/62-6/30/70. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Region 6. 102 p. **Notes**: An original copy.
Abstract: This accession consists of a timber management plan and associated memoranda and summaries. The plan was based on information contained in a document called "Forest inventory statistics for the Umatilla National Forest" (a copy of that report is in the history archives; see Jones, Welsh and Usher 1961). This report includes the following sections: record of review and approval; maps, forest, working circle and blocks; summary (resources, available annual cuts by working circle and block, effective date of plan, administrative exceptions to allowable cut, revision of the plan, chargeable and nonchargeable material); introduction (description of the Forest, social and economic relationships, ownership pattern, cooperation with other agencies); general objectives of timber management for the Forest; specific objectives of the Forest during the regulatory period (achieve full utilization of all species and size class, reach and maintain potential growth by proper timber stand improvement practices, improve quality of all species of timber, accomplish prompt reforestation, prescribe cutting practices, provide suitable timber sales, promote community stability); forest protection; forest regulation (rotation, growth, computation of sustained yield and allowable cut); North Umatilla Working Circle (summary of resource, potential sustained yield, description of working circle, forest description, calculation of allowable cut, silvicultural considerations, cutting practices, five year timber action plan, working circle cutting budget and control records); South Umatilla Working Circle (summary of resource, potential sustained yields, description of working circle, forest description, calculation of allowable cut for ponderosa pine and mixed conifer types, basic resources, calculation of other prospective allowable cuts, working circle cutting budget and control records, five year timber sale action plan, silvicultural considerations, cutting practices); and reference list. A four-page table entitled "Summary of inventory and management plans" is stapled to the inside front cover of this document. Stapled to the front of the cover are 6 memoranda from various levels of the Forest Service (Chief, etc.) expressing official approval or recommended revisions for the plan.
Keywords: Historical document/North Umatilla Working Circle/Umatilla NF/Timber management/Timber volume/Timber yields/Forest management/South Umatilla Working Circle/Timber management plan.

869. **U.S. Department of Agriculture, Forest Service**. **1955**. Timber sale action plans, fiscal years 1952-1955. Unpublished Processed Forms. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. Variable p. **Notes**: An original copy.
Abstract: This accession consists of a collection of processed forms that summarize timber harvest levels by working circle and Ranger District. It includes forms for fiscal year 1952 through fiscal year 1955, and for a variety of working circles (Heppner, Pendleton-Pilot Rock, Grande Ronde, Walla Walla, Clearwater, and La Grande). Forms are also included that summarize the "5-Year Budget" by working circle and Ranger District; the budget forms do not report financial information, but instead refer to a 5-year record of timber harvest (drain) that counted against the allowable annual cut for a working circle, as established in an approved timber management plan. Most of the information is supplied on "Five Year Timber Sale Action Plan" forms, "Detailed Timber Sale Action Plan" forms, "Detailed Sale Preparation Action Plan" forms, "Five Year Access Road Action Plan" forms, "Five Year Road Right-of-Way Plan" forms, and "Current Year Action Plan" forms. The "budget" information (volume available for cutting, and timber drain or harvest) was summarized on "Forest Plan for Five Year Budget" forms and "Forest Control Record" forms. Miscellaneous memoranda from the Regional Office that relate to timber management planning and record keeping requirements, and miscellaneous tables summarizing information from the timber management plan, are also included in this accession.
Keywords: Historical document/Timber harvesting/Timber sales/Clearwater Working Circle/La Grande Working Circle/Heppner Working Circle/Grande Ronde Working Circle/Pendleton-Pilot Rock Working Circle/Walla Walla Working Circle.

870. **U.S. Department of Agriculture, Forest Service**. **1961**. Timber sale action plans, fiscal years 1957-1962. Unpublished Processed Forms. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. Variable p. **Notes**: An original copy.
Abstract: This accession consists of a collection of processed forms that summarize timber harvest levels by working circle and Ranger District. It includes forms for fiscal year 1957 through fiscal year 1962, and for a variety of working circles (Morrow, North Fork, Wenaha, North Umatilla, and South Umatilla). Forms are also included that summarize the "5-Year Budget" by working circle and Ranger District; the budget forms do not report financial in-

formation, but instead refer to a 5-year record of timber harvest (drain) that counted against the allowable annual cut for a working circle, as established in an approved timber management plan. Most of the information is supplied on "Five Year Timber Sale Action Plan" forms (R6-2410-313) and "Forest Plan for Five Year Budget" forms (R6-2410-312). The "budget" information (volume available for cutting, and timber drain or harvest) was summarized on "Summary of Volume Available for Cutting" forms (R6-S301B) and "Forest Plan for Five Year Budget" forms (R6-S301A). Miscellaneous memoranda from the Regional Office that relate to timber management planning and record keeping requirements, and miscellaneous tables summarizing information from the timber management plan, are also included in this accession.
Keywords: Historical document/Timber harvesting/Timber sales/North Umatilla Working Circle/South Umatilla Working Circle/Morrow Working Circle/North Fork Working Circle/Wenaha Working Circle.

871. **U.S. Department of Agriculture, Forest Service**. **1963**. Timber sale action plans, fiscal years 1957-1964. Unpublished Processed Forms. Pendleton, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. Variable p. **Notes**: An original copy.
Abstract: This accession consists of a collection of processed forms that summarize timber harvest levels by working circle and Ranger District. It includes forms for fiscal year 1957 through fiscal year 1962, and for a variety of working circles (Morrow, North Fork, Wenaha, North Umatilla, and South Umatilla). Forms are also included that summarize the "5-Year Budget" by working circle and Ranger District; the budget forms do not report financial information, but instead refer to a 5-year record of timber harvest (drain) that counted against the allowable annual cut for a working circle, as established in an approved timber management plan. Most of the information is supplied on "Five Year Timber Sale Action Plan" forms (R6-2410-310). The "budget" information (volume available for cutting, and timber drain or harvest) was summarized on "Summary of Volume Available for Cutting" forms (R6-S301B) and "Forest Plan for Five Year Budget" forms (R6-S301A). Miscellaneous memoranda from the Regional Office that relate to timber management planning and record keeping requirements, and miscellaneous tables summarizing information from the timber management plan, are also included in this accession.
Keywords: Historical document/Timber harvesting/Timber sales/North Umatilla Working Circle/South Umatilla Working Circle/Morrow Working Circle/North Fork Working Circle/Wenaha Working Circle.

872. **U.S. Department of Agriculture, Forest Service**. **No date**. Timber sale key map. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 1:126720; [Projection unknown]; 18" x 21"; Colored Thematic. **Notes**: An original copy.
Abstract: This accession consists of a map showing timber sale areas for the southern portion of the Walla Walla Ranger District (the area contained within the old Pendleton Ranger District, which was combined with the Walla Walla District in the late 1970s). The base map shows the Pendleton–Pilot Rock and La Grande Working Circles, and the Gibbon, Elgin, and Five Points blocks. The legend includes the following: areas on which timber had been advertised, advertised areas on which timber had been sold (20 acres or more in size), areas that were cut over, areas that were lightly cut, areas on which cut-over field examinations had been made, areas on which data (surveys?) had been completed, areas on which contracts had been closed before all of the timber had been cut, free-use areas under regulation S-26, and sales at cost areas authorized by regulation S-22. In particular, the map shows these "Class D" timber sales: B.L. Burroughs Co. sale of Nov. 29, 1914; Meacham Creek sale of Nov. 29, 1914; Mt. Emily Lumber Company sale of Sept. 10, 1925; W. H. Culp "Class B" sale of Dec. 24, 1943; W. H. Culp trespass of November 1949 (5 acres); and Burnt River Lumber innocent trespass of Oct. 27, 1950 (20 acres).
Keywords: Historical map/Pendleton-Pilot Rock Working Circle/Timber harvesting/Timber sales/La Grande Working Circle/Pendleton RD.

873. **U.S. Department of Agriculture, Forest Service**. **1965**. Timber stand improvement handbook. FSH Handbook 2409.26c. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. Variable p. **Notes**: An original copy. Issued in increments between April, 1965 and October, 1987.
Abstract: This is a standard Forest Service Handbook issued by the Pacific Northwest Region. It contains the following chapters: introduction; release; precommercial thinning; and fertilization. A contents page is also included at the back for a chapter 50 (surveys), but there is no material behind that page.
Keywords: Forest management/Precommercial thinnings/Pacific Northwest Region/Fertilization/Release/Timber stand improvement.

874. **U.S. Department of Agriculture, Forest Service**. **1917**. Timber stand on national forests and purchase areas. Unpublished Typescript Report. Washington, DC: U.S. Department of Agriculture, Forest Service. 4 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document is a 4-page table summarizing timber volumes on the national forest system as of June

30, 1917. The first three pages of the table summarize saw timber (in MBF), cordwood (in cords), and total (in MBF) volumes by national forest or purchase unit, arranged by State. For Forests in the Blue Mountains, the volumes were: Malheur NF, 6,560,000 MBF; Minam NF, 1,873,000 MBF; Umatilla NF, 1,321,000 MBF; Wallowa NF, 3,611,000 MBF; Wenaha NF, 2,212,000 MBF; and Whitman NF, 4,500,000 MBF. A table on the last page summarizes volumes by tree species, regardless of which State or national forest the species occurs in. The two species with the highest volumes were Douglas-fir (141,401,243 MBF) and western yellow pine (104,907,601 MBF).
Keywords: Historical document/Malheur NF/Timber volume/Whitman NF/Minam NF/Umatilla NF/Wallowa NF/Wenaha NF.

875. **U.S. Department of Agriculture, Forest Service**. **1916**. Timber survey manual. Unpublished Typescript Report. [Washington, DC]: [U.S. Department of Agriculture, Forest Service]. 67 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: The purpose of this document was to present the policy of the Forest Service regarding timber surveys and to standardize the survey methodology throughout the Districts (Regions) whenever necessary and thereby assure reasonably accurate and consistent results. Conditions in the Districts, however, varied to such an extent that absolute standardization was not desirable and each District was expected to issue supplemental instructions that would describe how to handle that variation. This Manual includes the following sections: introduction; principles governing timber surveys; organization; field methods; forms; reports; records; and equipment. Following the timber survey manual (beginning on page 45) is another document or manual entitled "Standard classification of forest types" (revised June 1, 1916). It provides a standard classification of forest types that was designed to form the basis of all future descriptive and mapping work in the national forests, including grazing. The classification would be used for boundary, timber survey, timber sale, and general administrative work, including agricultural classification work, but not for soil classification. This Manual provides descriptions of vegetation types, including specific instructions about how they should be applied in individual Districts, or subdivisions of Districts such as states.
Keywords: Forest inventory/Forest mapping/Historical document/Land classification.

876. **U.S. Department of Agriculture, Forest Service**. **1947**. Training outline for timber disposal work. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service. Variable p. **Notes**: An original copy.
Abstract: This typescript training guide is about timber disposal regulations and procedures. It contains sections on: presale activities, sale development, sale administration, and job breakdowns.
Keywords: Timber disposal/Training guide/Timber sale administration/Historical document.

877. **U.S. Department of Agriculture, Forest Service**. **1938**. Tree planting on the prairie states forestry project. Unnumbered Pamphlet. Washington, DC: U.S. Department of Agriculture, Forest Service, Prairie States Forestry Project. 8 p. **Size**: 6" x 9". **Notes**: An original copy. Issued in October, 1938.
Abstract: Farmers in the Great Plains region of the country have long recognized the value of trees. A lack of knowledge about how to establish and protect tree plantings often resulted in wasted effort. As a result of the Prairie States Forestry Project, the requirements for success in growing trees in the Great Plains were better known than before. The practices and methods described in this leaflet are in use on the Prairie States project. The following topics are discussed: introduction; why plant trees?; some basic principles; procedure in planting; care of plantations; information about trees; and shelterbelts for protection.
Keywords: Farm forests/Forestry extension information/Great Plains/Historical document/Tree planting/Windbreaks/Shelterbelts.

878. **U.S. Department of Agriculture, Forest Service**. **1938**. Trees that temper the western winds. Unnumbered Pamphlet. Washington, DC: U.S. Department of Agriculture, Forest Service, Prairie States Forestry Project. 16 p.
Notes: An original copy. Issued in July, 1938.
Abstract: Farmers in the Great Plains region of the country have long recognized the value of trees. A lack of knowledge about how to establish and protect tree plantings often resulted in wasted effort. As a result of the Prairie States Forestry Project, the requirements for successful tree culture in the Great Plains were better known than before. This pamphlet describes the benefits and advantages of tree planting on the Great Plains using a series of photographs and simple, easily understood narratives. The following topics are discussed: pictures tell the story: the Prairie States Forestry Project; from nursery to field planting; these trees get good care; less than 3 years old – but they're 20 to 30 feet tall; a better place in which to live; one man's experience; and almost 85 million trees.
Keywords: Farm forests/Forestry extension information/Great Plains/Historical document/Tree planting/Windbreaks/Shelterbelts.

879. **U.S. Department of Agriculture, Forest Service**. **1967**. Umatilla River barometer watershed. Unpublished Typescript Report. [Pendleton, OR]: [U.S. Department of Agriculture, Forest Service, Umatilla National Forest]. 3 p.
Notes: An original copy.
Abstract: This accession consists of a 2-page summary report describing the Umatilla River barometer watershed program on the Umatilla National Forest, and a .375" to the mile map entitled "Umatilla Barometer Watershed." It was prepared for a Soil and Water Conservation District field trip that was held on July 7, 1967. The barometer watershed program was designed to determine the effects of management practices on hydrologic behavior. Bridging the gap between laboratory research and the managed watershed was the primary goal of the barometer watershed program. In time, the barometer watershed was expected to furnish the information necessary to predict the effects of a given land management practice on the water resources of an area. The watershed was instrumented to measure and record water circulation patterns for the Blue Mountains, i.e., how much precipitation occurred and what portion of it went to groundwater storage, surface streamflow, or to plant growth. The map shows the watershed boundary, subwatershed boundaries, the National Forest boundary, the Umatilla Indian Reservation boundary, county lines, private lands, the location of Corporation Guard Station, and the location of recording and non-recording instrumentation in the barometer watershed.
Keywords: Watershed management/Multiple use management/Umatilla NF/Umatilla River/Umatilla barometer watershed.

880. **U.S. Department of Agriculture, Forest Service**. **1970?** Western budworm: major defoliator of coniferous trees. Unnumbered Quad-fold Brochure. Missoula, MT: U.S. Department of Agriculture, Forest Service, Northern Region. 8 p. **Size**: 4" x 9". **Notes**: An original copy.
Abstract: This accession is a brochure that describes the western spruce budworm, a defoliator of grand/white fir, Douglas-fir, Engelmann spruce, and subalpine fir trees in the Inland West. It includes the following sections: the insect (caterpillar, moth, invade new areas, tree mortality, and seed loss); and what is being done? (research, natural control, and applied control with insecticides such as Zectran or Malathion). The brochure also includes several black-and-white photographs showing a budworm moth, a caterpillar, a pupal stage, an egg mass, a heavily-defoliated stand of Douglas-fir in eastern Montana, a DC-2 airplane applying insecticide, and a forest worker collecting Douglas-fir foliage to sample egg masses.
Keywords: Insect damage/Western spruce budworm/Insect control/Chemical insecticides/Zectran/Eastern Montana/Malathion.

881. **U.S. Department of Agriculture, Forest Service**. **1905?** Western yellow pine *(Pinus ponderosa)*. Forest Planting Leaflet 19. Washington, DC: U.S. Department of Agriculture. 2 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: Western yellow (ponderosa) pine is one of the largest and most valuable of the pines. This short leaflet includes the following topics as related to ponderosa pine: form and size; range; silvical qualities; economic uses; propagation; planting; and cultivation and care.
Keywords: Artificial regeneration/Tree planting/Silvics/Ponderosa pine/Historical document.

882. **U.S. Department of Agriculture, Forest Service**. **1946**. Working circle and block map for Pendleton Ranger District. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Umatilla National Forest, Pendleton Ranger District. 1:126720; [Projection unknown]; 18" x 21"; Colored Thematic.
Notes: An original copy.
Abstract: This accession is a map showing the boundary of the Pendleton Ranger District (the Pendleton RD was combined with the Walla Walla RD in the late 1970s); the Pendleton–Pilot Rock, La Grande and Walla Walla Working Circles; and the Milton, Gibbon, Elgin, McKay Creek, West Starkey, East Starkey and Five Points blocks. The base map was prepared in 1940; this map was dated March 1946.
Keywords: Historical map/Pendleton-Pilot Rock Working Circle/La Grande Working Circle/Pendleton RD/Walla Walla Working Circle/Walla Walla RD.

883. **U.S. Department of Agriculture, Forest Service; U.S. Department of Agriculture, Bureau of Entomology**. **1910-1911**. Miscellaneous memoranda regarding an insect infestation, Whitman National Forest. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service; U.S. Department of Agriculture, Bureau of Entomology. 25 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document consists of a series of memoranda about a mountain pine beetle infestation in northeastern Oregon – in particular an outbreak and associated control measures on the Whitman National Forest. The earliest memo, a one-pager dated December 13, 1910 from Henry S. Graves (The Forester [Chief]) to the District (Re-

gional) Forester for District 6 in Portland, references a memo from the District Forester (DF) to The Forester on November (actually October) 25th in which the DF stated that it would not be possible to give away the infested timber for free. The Forester asks the DF to check with the Forest Supervisor of the affected Forest because he was uncomfortable requesting a special appropriation from Congress to pay for control work based merely on the DF's impression that it would not be possible to give them away. The second memo is a 2-pager from Henry Graves to Dr. L. O. Howard, Chief of the Bureau of Entomology. It is also dated December 13, 1910. This memo mentions that Graves had received correspondence from Dr. A. D. Hopkins on October 10th in which Hopkins stated that 30 to 50 thousand dollars would be required for effective control of the insect infestation on the Whitman NF. Graves mentioned that the $5,000 supplied by the Forest Service for experimental control measures in 1910 was taken from the fire fighting fund – and that fund was in arrears by $915,000 due to a devastating fire year in 1910. Graves then stated that he was in favor of seeking a special appropriation from Congress in the amount of $40,000, although he was going to follow up with the DF in Portland to be sure that the trees couldn't be sold at a loss or given away to a lumberman for free (the first memo mentioned above). The third memo is a 2-pager from Howard to Graves, dated December 14, 1910, in which Howard states that the cooperative control project would probably have to be abandoned if the Forest Service was unable to obtain the special appropriation they were seeking from Congress. He states that agents of the Bureau estimated that the infestation had increased by 300% during the last year in certain yellow pine areas, and that the Bureau had already expended over $3,000 for field investigations and assistance they had rendered to the Forest Service and private landowners in northeast Oregon. Howard states that, in his opinion, a special appropriation of not less than $40,000 is needed for control work to be completed between April and July 1st, 1911, and that some of those funds be used for control work on private lands as well. The next 2-page memo is dated December 20, 1910 and is from A. F. Potter (?) to the Secretary (of Agriculture?). This memo lays out the previous history of the cooperative beetle control effort, as described in the other memos, and requests a special appropriation of $40,000 to continue the insect control project for the remainder of that fiscal year. The next memo, a 3-pager from the DF in Portland to The Forester in Washington, is dated December 20, 1910. The DF states that he had not taken up The Forester's idea of giving away the infested timber because he had just returned from the Whitman NF prior to writing his memo of October 25th and felt certain that it would not be possible to convince the lumbermen to take the trees, since they could not afford to do it on their own lands. The DF then states that he thinks the idea of selling large timber sales, in which some of the trees are infested and could be offered for a reduced stumpage price, has merit. He mentions that a sale of about 20 million board feet had just been made in that area (W. H. Eccles sale?) and that they believed an application for another sale of 70,000,000 feet was imminent. The next memo is a 2-pager dated December 23, 1910 from Henry Ireland, Forest Supervisor for the Whitman NF, to the DF in Portland. In it, Ireland states that the Forest had given careful consideration to The Forester's proposal, but that they had not had luck with that approach locally due to the isolation of the infested areas from transportation and market facilities. The next memo, a 3-pager dated December 26, 1910, is from H. W. Harris, Forest Supervisor for the Wallowa National Forest, to the DF in Portland. As was the case for Ireland, Harris states that it would be impossible to give the infested timber away due to its isolated location, the low volumes per acre, and the fact that most of it was low-value lodgepole pine. The next memo, a 4-pager from the DF in Portland to The Forester in Washington, was dated January 3, 1911. It reports the opinions from the Wallowa and Whitman Supervisors, and states that any control operations would probably have to be conducted with no thought of selling the timber that was cut, and without receiving any returns for the cost of the insect control project. The next memo, a short 1-pager from The Forester to Howard and dated January 19, 1911, states that there is definitely no possibility of selling or giving away the infested timber, and that a special appropriation would have to be obtained to continue the control work. The next memo is a short 1-pager from Howard to Graves, and dated January 21, 1911, in which he states that he had called at the Secretary's office yesterday (the 20th) and left word that it was time for the Secretary (of Agriculture) to write to Senator Chamberlain about a Senate amendment to provide the special appropriation. The next memo, a 2-pager with a colored map enclosure, was from George Cecil, acting DF for District 6, to The Forester and dated January 27, 1911. This memo states that a map had been prepared, in anticipation of further control work on the Whitman, Wallowa, and Malheur NFs, showing the land ownership in 80 townships in the vicinity of those three Forests. It was felt that such a map would be helpful for any future control ventures where private landowners would cooperate. The township plat maps also showed general vegetation types (pure yellow pine, mixed conifers, cut-over land, open grazing land, cultivated land) in addition to ownership data. A copy of the colored map, which shows the townships for which plats were developed, was copied with this memo (the copy is in color too). The last memo, a very short 1-pager, is from F. E. Ames, Acting Assistant Forester, to the DF in Portland and dated February 1, 1911. It states that the memo of January 27th, along with the accompanying map, had been received, although it was doubtful that cooperative work would be resumed during the coming season.

Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa-Whitman NF/Whitman NF/Blue Mountains/Wallowa NF/Malheur NF.

884. **U.S. Department of Agriculture, Forest Service; U.S. Department of Agriculture, Office of the Solicitor**. **1912**. Miscellaneous memoranda regarding a timber trespass case, Dixie Meadows Mining Company. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service; U.S. Department of Agriculture, Office of the Solicitor. 12 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a series of memoranda regarding a timber trespass case on the Whitman National Forest by the Dixie Meadows Mining Company of Prairie City, Oregon. It seems that the mining company owned a number of mining claims in the Forest and awarded contracts to several parties to cut timber from their claims for use at the mines. The contractors stated that they asked the mining company manager to point out the company's property lines but that he just told them to anywhere on the hill since it was all his property. When cutting the timber, the contractors went several hundred feet north of the Company's claims onto adjoining government land. The Company explained the mistake by stating that the claim holder to the south of their claim marked his north line about 100 feet north of its correct location so it was alright if the contractors went a corresponding distance onto government land. The contractors actually went from 200 to 400 feet beyond the Company's line and cut timber that was well onto the government's land. Forest Officers called at the mine several times and asked the manager to point out their lines so that no trespass would occur and then, once trespass did occur, it was promptly pointed out to the Company by a Forest Officer. Since there was no corrective response by the Company, the trespass was considered to be willful and it was recommended that they be prosecuted. Several of the memos in this accession concern the Forest Service's request (to the Attorney General) that the trespass be prosecuted, and the U.S.D.A. Office of the Solicitor's transmittal of the request to the Attorney General for their action. [Note that it is likely that the area involved in this trespass case is now located on the Malheur NF rather than the Wallowa-Whitman NF.]
Keywords: Blue Mountains/Historical document/Malheur NF/Timber sales/Dixie Meadows Mining Company/ Whitman NF/Timber trespass.

885. **U.S. Department of Agriculture, Forest Service; U.S. Reclamation Service**. **1914-1921**. Miscellaneous memoranda regarding windbreak plantings, West Extension of the Umatilla Project, Oregon. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service; U.S. Reclamation Service. 26 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This document consists of a series of memoranda dealing with a proposal to plant extensive windbreaks on a portion of a Reclamation Service water development project located in the west end of Umatilla County, Oregon. The proposal originated from the request of one of the earliest settlers in that part of the county, Mr. S. H. Boardman, for whom the town of Boardman was named. His request, as expressed in a memorandum to the District (Regional) Forester dated January 6, 1921, stated: "I am a resident of the W. Umatilla project residing at the above place. I am endeavoring to start a tree planting movement on the Project the coming Spring. I brought up the subject at the last Farm Bureau meeting. Was appointed a member of a committee of three to go into the subject. I seek advice from you. I should have stated that these trees are to be used as wind breaks. Locusts and populars I presume are the logical trees for this section. Would you advise catalpas. Would the Cal. eucalyptus grow here. If it possible should like to work in the nut trees. What about the filbert or walnut. We have the almond but the Spring frosts get them. The tree question has been overlooked on this project. I need all the aid I can get to awaken the people before the coming of Spring. Would it be possible for you to come here and look over our situation and address our Farm Bureau on the subject. It would do more towards awakening the people then any one thing. The Government had planned great things for this project from a tree standpoint. Please to secure map, if you do not have one, from project manager at Hermiston. It gives all the details. It would have been fine. We have now got to carry it out ourselves and would appreciate any aid you can give us. If you can come down will let you know date of meeting." The other memoranda in this accession consist of correspondence between the Forest Service and the Reclamation Service regarding the suitability of tree species for windbreak plantings, the cost of the project and potential sources of funding, and other logistical matters. The last memorandum, dated January 20, 1921, does not state whether windbreak plantings were ever established in the project area.
Keywords: Black locust/Erosion control/Historical document/Poplars/Umatilla County OR/Windbreaks/West Umatilla Project/Boardman OR.

886. **U.S. Department of Agriculture, Forest Service; U.S. Reclamation Service**. **1912**. Miscellaneous memoranda regarding windbreak plantings, West Extension of the Umatilla Project, Oregon. Unpublished Typescript Memoranda. [Place of publication varies]: U.S. Department of Agriculture, Forest Service; U.S. Reclamation Service. 22 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of six memoranda, dated from June 3, 1912 to July 24, 1912, dealing with a proposal to plant a series of windbreaks on a portion of a Reclamation Service water development project located in

the west end of Umatilla County, Oregon. The proposal was designed to mitigate the effects of severe wind action on irrigable lands in the project area. The effect of wind was particularly troublesome in that area because of the light and drifting character of the sandy soils. Wind was responsible for many drifting sand dunes and badly-eroding farm lands in the west end of Umatilla County near the Columbia River. The windbreaks were also necessary because the greater proportion of the Reclamation Service's maintenance costs for the Umatilla Project were related to clearing the lateral water canals of drifted sand. Properly placed, the windbreaks could afford important protection for the lateral canals. It was also anticipated that windbreaks would provide aesthetic benefits in an area devoid of forests, and could provide limited amounts of wood for fuel, fence and telephone posts, and other lumber necessary for farming operations in a region where those materials were not close at hand. In a practical sense, the windbreak project was viewed as beyond the capabilities of the Reclamation Service since it involved the planting and perpetual maintenance of 3,000 acres of trees (as planted in strips with a width of 200 to 300 feet). Therefore, the Reclamation Service and the U.S. Forest Service had been attempting to cooperate on the project, with the Forest Service providing the technical support for the windbreaks themselves. However, there were problems (even in 1912!) with regard to expenditure of Forest Service appropriations on an area that was not within the National Forest System. Since the windbreaks would be established in marginal areas from an agricultural standpoint, their establishment would have little or no effect on the irrigable lands developed by the water project, which were estimated to total 30,000 acres. It was intended that the land required for windbreak purposes be reserved at the time that subscription (application) is made by those farmers applying for the lands within the project area, and that the windbreak property be conveyed to the government as a perpetual easement if the windbreak project was ever authorized. [Compiler's note: the way this section is written gives me the impression that these lands had not yet been settled as of 1912, probably due to their marginal nature for agricultural purposes, and were still open for application under the Homestead Acts.] The first memorandum also includes a table showing the 36 tree species that had been tested at the Umatilla Experiment Farm in Hermiston, Oregon for possible use in the windbreak plantings. Tested species ranged from Burr oak and tulip poplar to Colorado blue spruce and pignut hickory. Other memoranda in this accession consist of correspondence between the Forest Service and the Reclamation Service regarding the cost of the project and potential sources of funding, and other logistical matters.
Keywords: Erosion control/Historical document/Umatilla County OR/Windbreaks/West Umatilla Project/Water development.

887. **U.S. Department of Agriculture, Office of Forest Investigations. 1919**. The use of wood for fuel. Bulletin No. 753. Washington, DC: U.S. Department of Agriculture. 40 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin provides a history of wood's use for fuel, and discusses the opportunities for its continued use as a fuel source in the future. The use of wood as an industrial and personal-use fuel supply is discussed, as are the possibilities of obtaining fuelwood from thinnings, wood waste, tops and limbs, and other unutilized sources. The opportunity to use wood in place of coal is also examined. The characteristics of wood as a fuel, such as the btu values associated with different species, are provided. Measures for promoting wood as a fuel source are included, as well as a bibliography of publications dealing with fuelwood.
Keywords: Fuelwood/Forest history/Forest policy/Wood energy/Historical document.

888. **U.S. Department of Agriculture, Office of Industrial Investigations. 1915**. The production of lumber in 1913. Bulletin No. 232. Washington, DC: U.S. Department of Agriculture. 32 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin presents statistics about lumber production in the United States in 1913. Statistics are provided for differing mill capacity classes, and for individual tree species or species groupings (yellow pine, oak, maple, etc.).
Keywords: Lumber production/United States/Historical document.

889. **U.S. Department of Agriculture, Soil Conservation Service**. **1972**. Resource conservation and development projects handbook. Unnumbered Published Handbook. Washington, DC: U.S. Department of Agriculture, Soil Conservation Service. Variable p. **Notes**: An original copy.
Abstract: This handbook was designed primarily for those who were responsible for assisting resource conservation and development (RC&D) project sponsors. It has three parts (sections), each of which was designed to stand on its own, thereby reducing the need for cross referencing. The introduction briefly describes what the handbook contains, gives its intended use and distribution, and tells how the handbook will be maintained. Part 100 describes the RC&D program as related to human and natural resources. Program principles, basic authorities, and policies that will be applied in administering the program are included. Part 101 sets forth guidance for RC&D project development and project planning. It details local responsibilities and the eligibility requirements for RC&D program

assistance. Part 102 includes guidelines for implementing the project plan and project operations. It describes procedures and responsibilities for SCS participation in project activities. Note: the Resource Conservation and Development program was authorized by the Food and Agriculture Act of 1962. It expanded opportunities for conservation districts, local units of government, and individuals to improve their communities in multicounty areas. The program was intended to assist them in enhancing their economic, environmental, and social well-being. The handbook contains seven appendixes and eleven exhibits.
Keywords: Agriculture/Historical document/Land use planning/Multiple-use management/Community development.

890. **U.S. Department of Agriculture, Soil Conservation Service**. **1941**. Survey report: run-off and waterflow retardation and soil erosion prevention for flood conrol purposes; appendix A: occupancy and economy; flood, streamflow and sedimentation damages; program analysis. Unnumbered, Unpublished Report. Spokane, WA: U.S. Department of Agriculture, Soil Conservation Service, Region 9. 205 p. **Notes**: An original copy.
Abstract: This appendix report accompanies a Survey Report entitled "Run-off and waterflow retardation and soil erosion prevention for flood control purposes; Walla Walla River watershed, Washington and Oregon." The survey and much of the preparation of this report were under the supervision of the Field Flood Control Coordinating Committee 21. The final stages of report preparation and editing were completed in the Regional Office of the Soil Conservation Service in Spokane, Washington. This copy of the appendix was marked confidential and was considered to be a draft version subject to revision before release of the final Survey Report. Three appendixes to the Survey Report are contained in the history archives, although a copy of the actual Report is not present. This appendix contains the following sections: objective; history of economic development; population; land ownership; land utilization; farm organization and income; water economy; pertinent laws and regulations; summary of present basic economy; history of floods; enumeration procedure; source of data and sampling procedure; damages from the 1931 flood; probable future flood damages; sedimentation damage; flood control benefits; agricultural income and farm organization; and analysis of costs and benefits. It also contains 105 tables, five maps, and 16 figures (graphs, etc.). This comprehensive document describes the economic setting of the Walla Walla watershed, which had little agricultural development prior to 1860 but had well established wheat farming and livestock production by 1870. The watershed had a long history of flooding, with floods of varying magnitude occurring every few years between 1867 and 1931. This passage describes the situation well: "The last three days of January 1867 witnessed a flood in Walla Walla. A warm rain brought down torrents of water from the melting snow on the mountains, and Mill Creek soon overflowing its banks, rushed down Alder Street, converting the lower end of town into a lake. Many buildings along the creek line were washed away, and others were seriously undermined and damaged. The floods occurred nearly every year, but seldom did much damage or reached uncontrollable proportions. One in 1875 caused the destruction of considerable property." A large portion of this appendix provides a flood history and analyzes some of the causal factors for those floods. There is a wealth of information provided in this and the other 2 appendixes in the series, not just about the natural resources of the Walla Walla River watershed, but also about its social, economic, and cultural characteristics.
Keywords: Agriculture/Floods/Columbia County WA/Historical document/Southeastern Washington/Umatilla County OR/Walla Walla River/Walla Walla County WA/Watershed management/Flood control/Land use planning.

891. **U.S. Department of Agriculture, Soil Conservation Service**. **1941**. Survey report: run-off and waterflow retardation and soil erosion prevention for flood conrol purposes; appendix B: watershed classification; soil, erosion, cover, infiltration survey; land use treatment plans. Unnumbered, Unpublished Report. Spokane, WA: U.S. Department of Agriculture, Soil Conservation Service, Region 9. 122 p. **Notes**: An original copy.
Abstract: This appendix report accompanies a Survey Report entitled "Run-off and waterflow retardation and soil erosion prevention for flood control purposes; Walla Walla River watershed, Washington and Oregon." The survey and much of the preparation of this report were under the supervision of the Field Flood Control Coordinating Committee 21. The final stages of report preparation and editing were completed in the Regional Office of the Soil Conservation Service in Spokane, Washington. This copy of the report was marked confidential and was considered to be a draft version subject to revision before release of the final Survey Report. Three appendixes to the Survey Report are contained in the history archives, although a copy of the actual Report is not present. This appendix contains the following sections: introduction; vegetative cover and land-use survey; soil, erosion and slope survey; soil loss, yield loss studies; surface run-off studies; infiltrometer investigation and survey; historical factors affecting watershed vegetation; waterflow retardation and soil erosion prevention measures; economic and social effects of the wild land program; and bibliography. It also contains 40 tables, five maps, and nine figures. There is a wealth of information provided in this and the other 2 appendixes in the series, not just about the natural resources of the Walla Walla River watershed, but also about its social, economic, and cultural characteristics. In particular, the "historical factors affecting watershed vegetation" section provides an informative environmental history of the wa-

tershed, including detailed descriptions of the livestock industry, game management, dry-land wheat farming, early floods and flood damage, and a short history of the Mill Creek watershed and other national forest areas in the watershed from 1905 to 1940. An example of that information is: "During the 15 years that have elapsed since 1925 the Mill Creek area has had no grazing by domestic stock. Predators have been rather consistently trapped or hunted, while deer and elk have increased unchecked. As a result the more or less natural balance has been upset, and the grazing pressure by game animals has increased until now (1940) much of the watershed is overgrazed, the soil disturbed by trampling and erosion – which had become largely stabilized – is again active."
Keywords: Agriculture/Floods/Columbia County WA/Historical document/Southeastern Washington/Umatilla County OR/Walla Walla River/Walla Walla County WA/Watershed management/Flood control/Land use planning.

892. **U.S. Department of Agriculture, Soil Conservation Service**. **1941**. Survey report: run-off and waterflow retardation and soil erosion prevention for flood conrol purposes; appendix C: geology, hydrology; watershed infiltration; recommended improvements. Unnumbered, Unpublished Report. Spokane, WA: U.S. Department of Agriculture, Soil Conservation Service, Region 9. 123 p. **Notes**: An original copy.
Abstract: This appendix report accompanies a Survey Report entitled "Run-off and waterflow retardation and soil erosion prevention for flood control purposes; Walla Walla River watershed, Washington and Oregon." The survey and much of the preparation of this report were under the supervision of the Field Flood Control Coordinating Committee 21. The final stages of report preparation and editing were completed in the Regional Office of the Soil Conservation Service in Spokane, Washington. This copy of the appendix was marked confidential and was considered to be a draft version subject to revision before release of the final Survey Report. Three appendixes to the Survey Report are contained in the history archives, although a copy of the actual Report is not present. This appendix contains the following sections: objectives; types of investigations; physiography; history; general climate; precipitation; storms; run-off and streamflow; general description of streams; mean monthly run-off, storage season and growing season; peak monthly flows and occurrence of peak flows; relation of precipitation to run-off; synchronization of peak flows from tributaries; effects of high flows; structures affecting streamflow; flood control projects of other agencies; proposed flood control projects of other agencies; precipitation and run-off stations; storm analysis; flood frequencies; flood expectancy zones; channel cross-sections and classification; channel deposition and scour; ground water; applying changes in infiltration rates to the watershed; recommended improvements; and bibliography. It also contains 38 tables, eight maps, and 20 figures (graphs, etc.). There is a wealth of information provided in this and the other 2 appendixes in the series, not just about the natural resources of the Walla Walla River watershed, but also about its social, economic, and cultural characteristics.
Keywords: Agriculture/Floods/Columbia County WA/Historical document/Southeastern Washington/Umatilla County OR/Walla Walla River/Walla Walla County WA/Watershed management/Flood control/Land use planning.

893. **U.S. House of Representatives** . **1861**. Indian depredations in Oregon and Washington. [Washington, DC]: 36th Congress, 2nd Session: 79-90.
Notes: A photocopy from microfiche. A copy of the microfiche is also stored in the history archives.
Abstract: This document consists of a series of letters, memoranda, short reports, and related materials pertaining to the U.S. military's dealings with American Indians in Oregon and Washington during the 1860s. It provides detailed records such as the military's expenses, supplies, and the names of emigrants who had been killed along various trails. Accounts of Indian raids and the names of emigrants killed in each raid, including descriptions of how they were killed (arrows, scalping, throats slit, etc.), are recounted in some of the narrative reports. Although this document provides some valuable insights into Euro-American/ Indian relations during the emigrant era, there are few reports or narratives that provide information about vegetation conditions of that time.
Keywords: American Indians/Eastern Oregon/Historical document/Oregon history/Oregon Trail/Emigration/Euro-American settlement.

894. **Unser, M. N. 1913**. Cabin at Clearwater Spring Ranger Station. Photo Number 16148A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 5, T. 8 N., R. 42 E., W. M. [app.]. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was also included on page 22 of George A. Bright's "Wenaha – Reconnaissance Extensive Report," a historically valuable report describing an extensive reconnaissance of the Wenaha National Forest conducted in 1913. A map was included in the reconnaissance report showing the general location of each photograph. [Note: Bright's report was reprinted in 1994 (see Bright and Powell 1994 in the history archives).] The caption shown beneath this photograph in the reconnaissance report was "Clearwater Ranger Station. A summer station showing dense stand of lodgepole in back-ground, from which a great deal of free use wood is taken during the summer. It is now comprised in a free use area. Fifty cords of wood per acre is not unusually cut from such stands,

which is the equivalent of 25,000 board feet, allowing 500 board feet per cord as a conservative converting factor." The caption associated with this photograph is "Cabin at Clearwater Spring Ranger Station." Camera settings: stop of 48. Light: sun & shade. Direction: S. W. Col. No. 50 Ho 313.
Keywords: Lodgepole pine/Clearwater Ranger Station/Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Timber harvesting/Timber yields/Garfield County WA.

895. **Unser, M. N. [1913]**. Dry Gulch Ranger Station. Photo Number 23621A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 36, T. 6 N., R. 42 E., W. M. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a high-quality black and white photograph, with all areas in sharp focus. This photograph was included in a 1994 reprint of a 1914 report prepared by George A Bright describing the results of a reconnaissance examination of the Wenaha National Forest (see Bright and Powell 1994). Bright did not use this photograph in the report, but the editor of the 1994 reprint (Powell) included it in an appendix of additional historical photographs pertaining to the Wenaha National Forest. The following information was provided on the back side of the hard-card on which the print was mounted – locality: Wenaha National Forest, Washington; subject: Dry Gulch Ranger Station; stop: 64; light: bright; hour: 11:30 am; direction: W.; permanent no.: 23621A; col. no. 50 Ho 61; relative situation: sec. 36, T 6 N, R 42 E., W. M.; taken by: M. N. Unser.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Dry Gulch Ranger Station.

896. **Unser, M. N. 1913**. Free-use timber piled alongside State Road #16. Photo Number 16153A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 8 or 9 N., R. 42 E. **Size**: 6½" x 4¾".
Notes: Two original copies attached to light brown card stock.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It is similar to a photograph included on page 23 of George A. Bright's "Wenaha – Reconnaissance Extensive Report," an historically valuable document describing an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption associated with this photograph is "Section of State Road #16 cut thru dense lodgepole pine; showing free use timber piled along road." Date is shown as July, 1913.
Keywords: Historical photograph/Umatilla NF/Forest roads/Pomeroy RD/Timber harvesting/Wenaha NF.

897. **Unser, M. N. 1913**. Hixson Gulch trail. Photo Number 16144A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 27, T. 9 N., R. 41 E. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a 7" x 9" card stock.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. The caption associated with this photograph states "Hixson Gulch trail, built by Forest Service, showing-switch backs." Notes on front of card stock shows "E" file designation and then "TRAILS" as the subject. It was also included in George A. Bright's "Wenaha – Reconnaissance Extensive Report" (see page 79). Bright's historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "The Forest Service trail down the ridge into Tucanon Creek. Timber on the canyon walls is mostly small Douglas fir growing in the more protected places, with large trees in the bottom and running up the secondary canyons for a short distance. The irregular white object in the center of the picture is a ploughed field."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Rocky Mountain Douglas-fir/Tucanon Creek/Agriculture/Tucannon River/Hixson Gulch.

898. **Unser, M. N. 1913**. Plate I, Tucanon Ranger Station. Photo Number 16139A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Tucannon Ranger Station. **Size**: 4½" x 6½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 4 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest

conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Tucanon Ranger Station."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Tucannon Ranger Station.

899. **Unser, M. N. 1913**. Plate II, Iron Springs Ranger Station. Photo Number 16158A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Iron Springs Ranger Station. **Size**: 4½" x 6½".
Notes: An original copy.
Abstract: The quality of this black and white print is excellent; the foreground and background views are in sharp focus and have good contrast and brightness. It was contained on page 6 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Iron Springs Ranger Station."
Keywords: Historical photograph/Umatilla NF/Iron Springs Ranger Station/Pomeroy RD/Wenaha NF.

900. **Unser, M. N. 1913**. Plate III, Godman Springs Ranger Station. Photo Number 16134A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Godman Springs Ranger Station. **Size**: 4½" x 6½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was included on page 7 of George A. Bright's "Wenaha – Reconnaissance Extensive Report," an historically valuable report describing an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Godman Springs Ranger Station."
Keywords: Historical photograph/Umatilla NF/Wenaha NF/Pomeroy RD/Godman Springs Ranger Station.

901. **Unser, M. N. 1913**. Plate IX, excellent yellow pine timber in a draw tributary to Tucanon River. Photo Number 16141. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: [Locality unknown]. **Size**: 4½" x 6½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 17 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Excellent yellow pine timber in a draw tributary to Tucanon River. Areas covered by timber in such draws are isolated, although the timber itself is often of excellent quality. This is a small mill proposition." Someone (possibly Irving Smith, Pomerory District Ranger in 1962-1968) wrote on the original copy of the report that this photograph may have been taken in School Canyon.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Tucannon River/Timber industry/Ponderosa pine/School Canyon.

902. **Unser, M. N. 1913**. Plate XI, Clearwater Ranger Station. Photo Number 16148A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Clearwater Ranger Station. **Size**: 4½" x 6½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 22 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location

where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Clearwater Ranger Station. A summer station showing dense stand of lodgepole in back-ground, from which a great deal of free use wood is taken during the summer. It is now comprised in a free use area. Fifty cords of wood per acre is not unusually cut from such stands, which is the equivalent of 25,000 board feet, allowing 500 board feet per cord as a conservative converting factor."
Keywords: Lodgepole pine/Clearwater Ranger Station/Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Timber harvesting/Timber yields.

903. **Unser, M. N. 1913**. Plate XII, lodgepole pine near Clearwater Ranger Station. Photo Number 16151A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Clearwater Ranger Station. **Size**: 4½" x 6½". **Notes**: Two original copies; one copy is contained in Bright's report, another copy (with a small portion of the upper right-hand corner missing) is in a separate folder in the history archives.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 23 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Part of the same stand as shown on Plate XI, surrounding Clearwater Ranger Station, showing free use wood cut and piled, lying by the side of the road."
Keywords: Lodgepole pine/Clearwater Ranger Station/Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Timber harvesting/Timber yields.

904. **Unser, M. N. 1913**. Plate XIV, burn in the transition type near Table Rock Mountain. Photo Number 16133A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Table Rock Mountain. **Size**: 4½" x 6½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 25 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Burn in the transition type near Table Rock Mountain."
Keywords: Fire effects/Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Forest fires/Table Rock Mountain.

905. **Unser, M. N. 1913**. Plate XLIII, Forest Service trail into Tucanon Creek. Photo Number 16144A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Hixson Gulch. **Size**: 4½" x 6".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 79 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "The Forest Service trail down the ridge into Tucanon Creek. Timber on the canyon walls is mostly small Douglas fir growing in the more protected places, with large trees in the bottom and running up the secondary canyons for a short distance. The irregular white object in the center of the picture is a ploughed field."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Rocky Mountain Douglas-fir/Tucanon Creek/Agriculture/Tucannon River/Hixson Gulch.

906. **Unser, M. N. 1913**. Plate XXIX, a band of sheep on the Forest. Photo Number 16155A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Clearwater Ranger Station. **Size**: 4½" x 6".

Notes: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 58 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "A band of sheep on the Forest being counted as they pass out of a corral. Near Clearwater Ranger Station." Someone (possibly Irving Smith, Pomerory District Ranger in 1962-1968) wrote on the original copy of the report that this photograph may depict the "old corral by [fire lookout] tower."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Clearwater Ranger Station/Grazing damage/Sheep grazing.

907. **Unser, M. N. 1913**. Plate XXVI, Iron Springs Ranger Station pasture and fence. Photo Number 16160A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Iron Springs Ranger Station. **Size**: 4½" x 6½". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 40 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Iron Springs Ranger Station pasture and fence at the extreme northern end of the Forest near the boundary. Timber is mostly yellow pine, occurring abundantly in swales and canyons. The intervening ridges are bare of trees but are covered with excellent bunch grass. All these ridges are capable of producing pine."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Iron Springs Ranger Station/Range management/Ponderosa pine/Horse grazing.

908. **Unser, M. N. 1913**. Plate XXX, tool box at Stockade Spring. Photo Number 16138A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Stockade Spring. **Size**: 4½" x 6".
Notes: An original copy.
Abstract: The quality of this black and white print is excellent; the foreground and background views are in sharp focus and have good contrast and brightness. It was contained on page 60 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Tool-box at Stockade Spring. One of the numerous boxes placed at strategic points over the Forest, containing fire-fighting tools, some cooking utensils, provisions, and horse feed."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Horse grazing/Fire fighting/Stockade Spring.

909. **Unser, M. N. 1913**. Plate XXXI, Mud Spring. Photo Number 16135A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Edmiston Spring. **Size**: 4½" x 6". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 62 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Mud Spring, after being improved by the Forest Service." Someone

(possibly Irving Smith, Pomerory District Ranger in 1962-1968) wrote on the original copy of the report that this photograph may depict Edmiston Spring, which had been called "Mud Spring."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Horse grazing/Mud Spring/Edmiston Spring/Range management.

910. **Unser, M. N. 1913**. Plate XXXII, Round Prairie Spring. Photo Number 16163A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Round Prairie Spring. **Size**: 4½" x 6".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 63 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Round Prairie Spring – developed by the Forest Service." A photo taken in approximately the same spot as Plate XXXII was found behind the original. It was taken by Irving Smith, Pomeroy District Ranger, on August 18, 1965.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Horse grazing/Range management/ Round Prairie Spring.

911. **Unser, M. N. 1913**. Plate XXXIII, Forest Service telephone line. Photo Number 16150A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Clearwater Ranger Station. **Size**: 4½" x 6".
Notes: Two original copies; one copy is contained in Bright's report, another copy (an enlargement measuring 8" x 10") is in a separate folder in the history archives.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It was contained on page 64 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Forest Service telephone line between Clearwater Ranger Station and Tucanon Ranger Station." In addition, two black and white photographs were taken in 1963 at approximately the same spot as Plate XXXIII. The photographer is unknown. The size of the two photographs is 3¼" x 4½" and they are placed directly behind photo 16150A within the report.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Clearwater Ranger Station/Tucannon Ranger Station.

912. **Unser, M. N. 1913**. Plate XXXIV, near the top of Table Rock Mountain. Photo Number 16132A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Table Rock Mountain. **Size**: 4½" x 6". **Notes**: An original copy.
Abstract: The quality of this black and white print is moderate; most of the foreground and background views are in sharp focus. It was contained on page 68 of George A. Bright's "Wenaha – Reconnaissance Extensive Report." This historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Near the top of Table Rock Mountain, showing excellent bunch grass growing on the west slope."
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Bunchgrass ranges/Table Rock Mountain.

913. **Unser, M. N. 1913**. Round Prairie spring development. Photo Number 16164A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Sec. 12, T. 8 N., R. 43 E., W. M. [app.]. **Size**: 4½" x 6½".
Notes: An original copy, mounted on a thick 7" x 9" hard-card.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background

views are in sharp focus. The caption associated with this photograph was "Round Prairie spring development, showing trough and fence built by Forest Service." This photograph was also used on page 63 of George A. Bright's "Wenaha – Reconnaissance Extensive Report," a valuable report describing an extensive reconnaissance of the Wenaha National Forest conducted in 1913. A map in the reconnaissance report shows the general location of each photograph. [Note: in 1994, Bright's report was reprinted (see Bright and Powell 1994).] Camera settings: stop 64. Light: diffuse. Hour: 10:40 a.m. Direction: S.E. Col. no. 50 AR 16.
Keywords: Umatilla NF/Historical photograph/Wenaha NF/Pomeroy RD/Horse grazing/Range management/ Round Prairie Spring/Asotin County WA.

914. **Unser, M. N. 1913**. Stockade Spring fire tool box and shed. Photo Number 16137A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: T. 8 N., R. 40 E., sec. 11 [or 2?]. **Size**: 4½" x 6½". **Notes**: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of high quality. The following information is provided on the back of the hard-card on which the print is mounted – locality: Wenaha National Forest, Columbia County, Washington; date: July 29, 1913; subject: Stockade Spring fire tool box and shed; stop: 16; light: shade; hour: 2 P. M.; direction: southwest; permanent no.: 16137A; col. no.: 50 Mill; relative situation: Sec 11, T 8 N R 40 E W. M.; taken by: M. N. Unser. This photograph was included on page 60 of George A. Bright's "Wenaha – Reconnaissance Extensive Report" (actually a photo from the exact same spring, but not the same photograph because the version used in Bright's report (16138A) has a sign hanging above the tools with a swastika symbol on it. This version does not have a swastika sign). Bright's historically valuable report describes an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Tool-box at Stockade Spring. One of the numerous boxes placed at strategic points over the Forest, containing fire-fighting tools, some cooking utensils, provisions, and horse feed."
Keywords: Historical photograph/Columbia County WA/Umatilla NF/Pomeroy RD/Stockade Spring/Fire prevention/Wenaha NF.

915. **[Unser, M. N. [1913]**. Tucannon Ranger Station. Photo Number 16142A. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Tucannon Ranger Station. **Size**: 4½" x 6½".
Notes: An original copy.
Abstract: The quality of this black and white print is moderate to good; most of the foreground and background views are in sharp focus. It is similar to a photograph included on page 4 of George A. Bright's "Wenaha – Reconnaissance Extensive Report," an historically valuable report describing an extensive reconnaissance of the Wenaha National Forest conducted in 1913. In addition to narratives about the natural resources, existing uses, and management opportunities of the Forest, the report includes 42 black-and-white photographs. A map was included showing the location where each photograph was taken. [Note: in a 1994 reprint of this report (see Bright and Powell 1994), the editor included additional historical photographs of the Wenaha National Forest in an appendix.] The caption shown beneath this photograph in the reconnaissance report was "Tucanon Ranger Station." The photograph in Bright's report was numbered 16139A, whereas this photo is number 16142A. It is very likely that Unser took them on the same day in July of 1913. The photograph in the reconnaissance report was a distant shot showing the entire Ranger Station grounds from behind (including outbuildings and corrals); this photograph has a closer perspective and is taken from in front of the main station headquarters building.
Keywords: Historical photograph/Umatilla NF/Tucannon Ranger Station/Wenaha NF.

916. **Van Dersal, William R. 1938**. Native woody plants of the United States, their erosion-control and wildlife value. Miscellaneous Publication No. 303. Washington, DC: U.S. Department of Agriculture. 362 p. **Size**: 6" x 9".
Notes: An original copy.
Abstract: This handbook was prepared during the late 1930s, an era when a protracted drought led to a heightened awareness of the importance of conservation of natural resources. As a result of the dust bowl and similar events related to drought and agricultural developments on marginal areas, people watched as the their most basic resource, the soil, was destroyed or lost at an ever-increasing rate over a relatively short span of years. As concerns about soil degradation mounted, this publication and others were developed to describe the erosion-control and soil-stabilization value of native plants. This handbook, which describes native woody plants of the United States, includes the following sections: introduction; the relation of vegetation to soil conservation; evaluation of plants for erosion control and wildlife; planting for soil and wildlife conservation; plants of objectionable characteristics; se-

lection of species for planting; development of the plant-growth region map; plant-growth regions; nitrogen-fixing bacteria; explanation of the list; list of woody plants; bibliography; and list of common names of woody plants. Two maps are included in a back pocket of this book (figures 2 and 3; it is unknown if there was a third map called figure 1 that is missing): climatic provinces and plant growth regions of the United States (figure 2), and important soil regions and plant growth regions of the United States (figure 3).
Keywords: Botany/Erosion control/Historical document/Plant identification/United States/Wildlife management.

917. **Van Winkle, Walton**. **1914**. Quality of the surface waters of Oregon. Water-Supply Paper 363. Washington, DC: Department of the Interior, United States Geological Survey. 137 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This report contains the following sections: outline of investigation; previous work; value of information regarding the quality of surface waters; natural features of Oregon; economic features; constituents of natural waters; water for domestic use; water for boilers; water for use in factories; purification of water; methods of analysis; interpretation of the results of analysis; San Francisco Bay drainage basin; North Pacific Coast drainage basins; Columbia River drainage basin; the Great Basin; general characteristics of the surface waters; summary; and index.
Keywords: Columbia River/Historical document/Oregon/John Day River/Watershed management/Water quality/ Umatilla River.

918. **Vaughan, Thomas; Winch, Martin**. **1965**. Joseph Gervais, a familiar mystery man. Oregon Historical Quarterly. 66 (4): 331-362. **Notes**: A photocopy of an original.
Abstract: This article describes the history of an early trapper and explorer named Joseph Gervais. Gervais was a member of Wilson Price Hunt's overland exploration party of 1811. That party eventually reached the Pacific near the mouth of the Columbia River in February, 1812. Gervais was considered to be the first white resident of the Willamette Valley, where he settled in the early to mid 1820s. The balance of the article describes Gervais' early life in Oregon, although its descriptions about vegetation conditions are sparse and mostly confined to the Willamette Valley area of Oregon.
Keywords: Oregon history/Fur trapping/Willamette Valley/Explorer journals.

919. **Victor, Frances F. 1900**. Our public land system and its relation to education in the United States. Quarterly of the Oregon Historical Society. 1: 132-157. **Notes**: A photocopy of an original.
Abstract: This article discusses the history of land ownership in the United States, going back to the colonial period. In particular, disposal and administration of public domain land is described, as is use of receipts from those lands as a source of funding for public education.
Keywords: Historical document/Land use planning/Oregon history.

920. **von Schrenk, Hermann**. **1900**. Fungous diseases of forest trees. In: U.S. Department of Agriculture, Yearbook of the Department of Agriculture. Washington, DC: U.S. Department of Agriculture: 199-210.
Notes: A photocopy of an original.
Abstract: This article was written by an instructor in the Shaw School of Botany, and who was also a Special Agent in the Division of Vegetable Physiology and Pathology for the Department of Agriculture. The author describes some important fungus diseases of forest trees, especially those that injure the wood in such a way as to lower its value for lumber. The following topics are discussed: fungi which destroy the wood; how trees are infected; how wounds are formed; how trees become infected; age at which trees are infected; how the fungi destroy the heartwood; rate of decay; fruiting organs; some destructive fungi; treatment of forest trees; the role of fungi growing on dead timber; relation of fungi to structural timber; and remedies.
Keywords: Tree diseases/Historical document.

921. **Wagener, Willis W. 1961**. Guidelines for estimating the survival of fire-damaged trees in California. Miscellaneous Paper 60. Berkeley, California: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. 11 p. **Notes**: A photocopy of an original.
Abstract: Survival of conifers after fire damage depends on time of year when the fire occurred, the growth vigor of the damaged tree before the fire, and degree of damage to cambium, foliage, and twigs. Guides by tree species or species groups are given for judging survival chances of individual damaged trees.
Keywords: Fire effects/California/Ponderosa pine/Historical document.

922. **Wahlenberg, W. G. 1922**. FS-161(d) progress report: source of seed – Douglas-fir; season of 1921. Unpublished Typescript Report. Haugen, Montana: U.S. Department of Agriculture, Forest Service, Savenac Nursery. 9 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.

Abstract: This accession describes a study that was initiated to "determine the effects of seed source and climatic varieties on the suitability of planting stock for reforestation in the western part of District (Region) One." The plantations were established in the spring of 1916 in the "Parker area;" this report describes an examination of those areas made in the summer of 1921. Seed sources used in the experiment were: Lolo, Colville, Kootenai, Wenatchee, Corvallis, and Tacoma. At the time of the 1921 examination, survival ranged from 6.3% (Tacoma) to 39.5% (Lolo). Survival had ranged up to 95.9% in 1916 and up to 79.4% in 1917, so the 1921 results represent significant declines in survival over a four-year period. Unfortunately, detailed information about the seed sources was not available (exact location, elevation, site quality, etc.), which would minimize the opportunity to extrapolate the results from this study to other sites or areas. The site on which the plantations were established was dominated by Ceanothus brush, which was believed to have benefitted the plants in many cases because of the shade it afforded. In other instances, the competition from the brush was too great and was believed to have affected their survival and growth. It was noted that early problems with a disease *(Bortrytis douglasii)* also affected the growth and form of the seedlings. The report includes 6 black-and-white photographs showing seedlings from various seed sources and in a variety of situations. It is interesting that the author had to clear away the brush in order to take the pictures for many of the seedlings, indicating the density of the fire-origin brush field. In fact, the last photograph is a "general view of the Parker experimental area showing rank growth of Ceanothus brush (buck brush)."
Keywords: Artificial regeneration/Historical document/Plantation protection/Tree planting/Douglas-fir/Western Montana/Seed source.

923. **Wahlenberg, W. G. 1941**. Methods of forecasting timber growth in irregular stands. Technical Bulletin No. 796. Washington, DC: U.S. Department of Agriculture. 55 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes techniques for forecasting future timber growth, including a description of the following topics: approximations of growth rates; the stand-table projection method of growth estimation; and the recurring-inventory method of growth estimation. An extensive literature citation section is also included.
Keywords: Timber yields/Volume tables/Historical document.

924. **Wakeman, William J. 1936**. Land exchange – First National Bank of Heppner. Portland, OR: U.S. Department of Agriculture, Forest Service, Umatilla National Forest. 1:15840; [Projection unknown]; 26" x 30"; Colored Thematic. **Notes**: An original copy.
Abstract: This full-color map was contained in the back pocket of a publication entitled "Report and accompanying appraisal of First National Bank of Heppner lands in Morrow County, Oregon" by William J. Wakeman (see Wakeman 1936 for more information about the parent publication). It shows vegetation types within a large land exchange area in townships 4 and 5 south, range 28 east. The area ranged from Porcupine Ridge in the southwest to Shaw Creek in the northeast, all of which was on the Heppner Ranger District. The following items are included in the legend: ponderosa pine, mature; ponderosa pine, immature; ponderosa pine, saplings and poles; ponderosa pine, seedlings; white fir, larch, Douglas fir, mature; white fir, larch, Douglas fir, immature; white fir, larch, Douglas fir, seedlings; Douglas fir, mature; lodgepole pine, immature; grassland; and brush. The map also includes annotations showing roads, ridges?, elevations, section lines, landmark names, and the presence of old burns.
Keywords: Forest types/Historical map/Maps/Heppner RD/Umatilla NF/Vegetation types.

925. **Wakeman, William J. 1936**. Report and accompanying appraisal of First National Bank of Heppner lands in Morrow County, Oregon. Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 14 p.
Notes: An original copy.
Abstract: This report was prepared by a "timber expert." It describes the land uses, characteristics, and timber values associated with a 4,870-acre land exchange located at the head of Willow, Ditch, and Potamus Creeks about 20 miles southeast of Heppner, Oregon. The report includes the following sections, all of which pertain to the "offered lands" in the exchange: description; acreage by dominant types (866 acres of merchantable ponderosa pine; 2,001 acres of merchantable white fir, larch, Douglas fir type; 43 acres of ponderosa pine seedlings and saplings; 224 acres of open grass and sagebrush; 4 acres of brush; 601 acres of lodgepole pine protection forest; and 1,111 acres of white fir, larch, Douglas fir type protection forest); physical and climatic conditions (elevation, topography, soil, precipitation, temperature, frost); agricultural possibilities; accessibility; existing uses, easements or forms of occupancy; actual or potential values of subsidiary character; grazing values; timber values (including a table showing net volumes in thousand board feet by township, range, and section for seven species or merchantability classes); appraisal; summary of logging costs (including logging, milling and selling, and interest charges); reduction to present net worth; distribution of income; and summary of appraised values and recommendations. This accession also included a full-color map contained in a back pocket. The map was removed and processed as a separate item (see "Land exchange – First National Bank of Heppner" by William J. Wakeman (1936) for more information about the

map).
Keywords: Forest types/Heppner RD/Umatilla NF/Blue Mountains/Forest inventory/Historical document/Willow Creek/Ditch Creek/Potamus Creek.

926. **Walcott, Charles D. 1905**. Work of the Geological Survey in mapping the reserves. Proceedings of the American Forest Congress. Washington, DC: H. M. Suter Publishing Company: 364-380.
Notes: A photocopy of an original.
Abstract: This article is the text of an address given by the head of the U.S. Geological Survey (USGS) on its role in the surveying and examination of the forest reserves. The balance of the article describes some of the history of the forest reserves, and how the USGS came to acquire responsibility for their examination and survey. He also discusses geological investigations commonly completed by the Survey, and how those activities could be accomplished on the reserves.
Keywords: Forest reserves/Historical document/U.S. Geological Survey.

927. **Watt, Alex S. 1947**. Pattern and process in the plant community. Journal of Ecology. 35 (1/2): 1-22.
Notes: A photocopy of an original.
Abstract: This article attempts to describe how a plant community is put together, how it works, and how that knowledge provides something of value in terms of diagnosis. The following topics are discussed in this article: the plant community as a working mechanism; the evidence from seven communities: the regeneration complex, dwarf Callunctum, eroded Rhacomitrietum, bracken, grassland A, grass-heath on acid soils, beechwood; supplementary evidence; comparison and synthesis; some implications: animals and micro-organisms, the nature of the plant community; and references. This article was produced during an era when ecologists were actively debating whether plant communities should be viewed as stable, organismic entities, or as dynamic, non- deterministic units.
Keywords: Forest ecology/Historical document/Plant ecology/Plant succession/Vegetation classification.

928. **Watt, Richard F. 1960**. Second-growth western white pine stands. Technical Bulletin No. 1226. Washington, DC: U.S. Department of Agriculture. 60 p. **Size**: 6” x 9”. **Notes**: An original copy.
Abstract: This detailed bulletin describes the results of studies conducted in second-growth western white pine stands in northern Idaho. Much of the information is based on repetitive measurements from 94 permanent plots, most of which were initially established in the 1920s or 1930s. The primary findings of this bulletin have to do with site index and species composition changes, normality percentage trends, and mortality.
Keywords: Western white pine/Northern Idaho/Timber yields/Site index/Mortality/Historical document.

929. **Watts, Lyle F.; Dean, Anthony P. 1948**. Umatilla National Forest, Oregon and Washington, visitor’s map. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 1:253440; Polyconic; 20” x 29”; Thematic. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of a general visitor’s map of the Umatilla National Forest. The base map was compiled at the Regional Office in Portland, Oregon in 1939 and was based on USGS, Bureau of Land Management (formerly GLO), Forest Service and other surveys. Base information was revised in Portland, Oregon in January of 1948. The legend includes the following items: the Umatilla NF boundary, adjacent national forest boundaries, good motor roads, poor motor roads, trails, railroads, telephone lines, telephone lines along roads, telephone lines along trails, the Supervisor’s headquarters, District Ranger stations, Guard or Ranger stations not permanently occupied, permanent lookout stations, triangulation stations, emergency lookouts or observation points, improved recreation areas, and houses, cabins or other buildings.
Keywords: Historical map/Maps/Umatilla NF.

930. **Weaver, Harold**. **1957**. Effects of prescribed burning in ponderosa pine. Journal of Forestry. 55 (2): 133-138.
Notes: A photocopy of an original.
Abstract: This article summarizes the effects of prescribed burning in ponderosa pine forests on the Colville Indian Reservation in northeastern Washington. Prescribed burning had been used to reduce fire hazard and for silvicultural benefits, principally as a thinning tool. The following topics are discussed: stand conditions, the burning operations, results and discussion, and conclusions.
Keywords: Fire effects/Northeastern Washington/Colville Reservation/Historical document/Prescribed burning/Fire ecology.

931. **Weaver, Harold**. **1957**. Effects of prescribed burning in second growth ponderosa pine. Journal of Forestry. 55 (11): 823-826. **Notes**: A photocopy of an original.
Abstract: This article discusses the use of prescribed burning in the management of second growth ponderosa pine

stands. It is based on second growth stands found on the Klamath Indian Reservation in southern Oregon. Weaver describes the results and ecological changes arising from the prescribed burning program on the reservation. The following topics are discussed in detail: stand conditions; prescribed burning and stand improvement; results and discussion; and summary and conclusions. It was found that prescribed burning was very effective at killing bitterbrush, a common shrub species in the undergrowth of ponderosa pine forest. It was typically replaced with grassy undergrowths dominated by fescues. The author considers that change to be one of the benefits of using prescribed fire, since the loss of bitterbrush reduces fire hazard and, even though bitterbrush is considered palatable livestock forage, results in a better grazing situation.
Keywords: Fire ecology/Fire effects/Historical document/Southern Oregon/Prescribed burning.

932. **Weaver, Harold**. **1943**. Fire as an ecological and silvicultural factor in the ponderosa pine region of the Pacific Slope. Journal of Forestry. 41: 7-14. **Notes**: A photocopy of an original.
Abstract: The article begins with: "wherever man goes in the ponderosa pine region of the Pacific Slope (California, Oregon, Washington, Idaho and Montana) he sees evidence of past fires." The author goes on to explain that facts indicate that periodic fires, in combination frequently with pine-beetle attacks, formerly operated to control the density, age classes, and composition of ponderosa pine forests. The following topics are discussed in some detail: the record of the tree rings; fire as a cause of even-aged grouping of pines; influence of fire on even-aged stands; burns at higher altitudes; importance of fire as an ecological factor; and present conditions in the ponderosa pine forests. He concludes with: "it is obvious that the present policy of attempting complete protection of ponderosa pine stands from fire raises several very important problems. How, for instance, will the composition of the reproduction be controlled? If ponderosa pine is desired on vast areas how, unless fire is employed, can other species such as white fir be prevented from monopolizing the ground? On the other hand, if it is decided to permit such species as white fir to come in under mature ponderosa pine, how much of the public's money are foresters justified in spending in trying to keep fire out? Even with unlimited funds, personnel, and equipment, can they give reasonable assurance that they can continue to keep such extremely hazardous stands from burning up? If they reasonably sure of this, can they then give assurance that the timber products of such stands will be more valuable than those that might otherwise be derived from ponderosa pine and will in addition justify the high protection costs?"
Keywords: Fire ecology/Fire effects/Historical document/Prescribed burning/Forest policy.

933. **Weaver, Harold**. **1947**. Fire – nature's thinning agent in ponderosa pine stands. Journal of Forestry. 45: 437-444. **Notes**: A photocopy of an original.
Abstract: This article describes the uses, and benefits, of prescribed fire as a thinning tool for overstocked ponderosa pine stands. The following topics are discussed: description of stand (article is based on work done in a pine stand outside of Nespelem, Washington); purpose of study; method of gathering data; results; and discussion. The author concludes that burning was an effective thinning tool, especially in sapling to small pole-size stands, where fire eliminated most of the suppressed and intermediate trees.
Keywords: Fire ecology/Fire effects/Historical document/Prescribed burning/Thinning.

934. **Weaver, Harold**. **1947**. Management problems in the ponderosa pine region. Northwest Science. 21 (4): 160-163. **Notes**: A photocopy of an original.
Abstract: This article discusses intensive management of ponderosa pine forests in the Pacific Northwest, including a description of obstacles that must be overcome before intensive management can be achieved. The following topics are discussed: primeval forest conditions; prescribed burning on the Colville Reservation; methods employed; results; and discussion. The author concludes that prescribed fire, periodically applied, may eventually prove to be silviculturally desirable over large portions of the ponderosa pine region. Even if that eventuality does not occur, the author believes that implementation of intensive forestry will involve more than merely suppressing fires and practicing selective cutting.
Keywords: Fire effects/Northeastern Washington/Colville Reservation/Historical document/Prescribed burning/Fire ecology.

935. **Weaver, John Ernst**. **1914**. Evaporation and plant succession in southeastern Washington and adjacent Idaho. The Plant World. 17 (10): 273-294. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This paper reports on some climatological measurements collected in southeastern Washington and adjacent portions of Idaho (actually south-central Washington, since the study area is entirely north of the Blue Mountains in southeastern Washington) during a study of plant succession and ecological conditions in that area. Evaporation was measured with a porous cup atmometer, since the "evaporating power of the air is a rather satisfactory summation of the atmospheric factors which determine the growth of plants during that portion of the season free from frost." Graphs are provided which show the evaporation rates in sampled plant associations throughout the

growing season. Sampled vegetation types included the following associations: prairie, bunchgrass-rimrock, pine, fir-tamarack, and cedar.
Keywords: Historical document/Southeastern Washington/Idaho/Plant succession/Vegetation classification.

936. **Weaver, John Ernst**. **1915**. A study of the root-systems of prairie plants of southeastern Washington. The Plant World. 18 (9): 227-248; 273-292. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: When studying the plant formations and associations of semi-arid southeastern Washington in 1912-1914 (see several other accessions by this author for more information about the additional studies), the author soon realized that a proper understanding of the development and structure of those associations was only possible after acquiring knowledge about the root systems of the more important prairie species. Consequently, during the fall, winter, and spring of 1913-1914, more than 350 root systems of 25 of the most important ecological species were examined. This paper describes the root systems of those species, along with a discussion of the site conditions under which the plants grow. The study area includes the "Palouse" prairies, which are bounded by the foothills of the Bitterroot Mountains on the east; the sagebrush region of western Adams, eastern Franklin, and western Walla Walla Counties, Washington on the west; the high upfold of lava-rock known as the Blue Mountains on the south; and the Spokane gravels with their open growth of ponderosa pine extending southwestward from Spokane, Washington on the north. The following sections are included in this paper: the factors of the habitat; soils and soil moisture; temperature; other factors; scope and methods of the study of root-systems; and discussion and conclusions. The following species were studied (only scientific names were given, and some of those names have undoubtedly changed since 1915): *Lupinus ornatus, Lupinus leucophyllus; Astragalus (Phaca) arrectus; Agropyron spicatum; Festuca ovina ingrata; Poa sandbergii; Koeleria cristata; Balsamorhiza sagittata; Geranium viscosissimum (Geranium incisum); Wyethia amplexicaulis; Heuchera glabella; Leptotaenia multifida; Helianthella douglasii; Hoorebekia (Aplopappus) racemosa; Lithospermum ruderale; Sieversia ciliata; Sidalcea oregana; Hieracium scouleri; Potentilla blaschkeana;* and *Eriogonum heracleoides*. The most obvious conclusion reached by the author was that the relatively severe environmental conditions found on the prairies of southeastern Washington were met by the plants using well-developed and extensive root systems. He then provides some ecological implications of the study, particularly with regard to shallow-rooted grasses *(Poa sandbergii, Koeleria cristata, Festuca ovina ingrata)* versus deep-rooted grasses and how those differences are reflected in plant phenology and the habitat occupied by the various species. Weaver observed that almost all of the species studied could be classified as "generalized" with respect to their root systems, which means that both the tap and lateral components of the root system are well developed. He also summarized root system characteristics by aspect, which showed that root lengths on northeast and southwest slopes were about the same and that the marked environmental differences embodied by those slope exposures apparently had little effect on root depth. Many of the studied plants had extremely deep root systems, suggesting that the deepest roots are found in areas where rainfall is adequate or abundant, but where soil porosity allows rapid downward movement of soil water to a water table that is relatively deep. Weaver also noted that the roots exhibited remarkable individuality between species, so that peculiarities of form, branching habit, position in the soil, texture, color, odor, or taste could be used to separate one root system from another.
Keywords: Historical document/Southeastern Washington/Blue Mountains/Central Idaho/Plant ecology/Root systems/Palouse prairies.

937. **Weaver, John Ernst**. **1917**. A study of the vegetation of southeastern Washington and adjacent Idaho. University Studies. 17 (1): 1-133. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This accession is a Ph. D. thesis. It describes the plant formations and associations found in the semi-arid prairies of southeastern Washington and into adjacent Idaho. These "Palouse" prairies are bounded by the foothills of the Bitterroot Mountains on the east; the sagebrush region of western Adams, eastern Franklin, and western Walla Walla Counties, Washington on the west; the high upfold of lava-rock known as the Blue Mountains on the south; and the Spokane gravels with their open growth of ponderosa pine extending southwestward from Spokane, Washington on the north. The following topics are discussed: extent and position of the study area; physiographic regions and geology; soils; topography and drainage; general plant life conditions; general vegetational distribution; outline of developmental series; evaporation and soil moisture in relation to succession; soil temperature in relation to succession; the prairie-plains formation; the desert scrub formation; the Pacific Coast formation; natural reforestation in cut-over areas and in burns; hydrosere; and ruderal vegetation. Many photographs are provided at the end of the thesis.
Keywords: Historical document/Southeastern Washington/Blue Mountains/Idaho/Plant succession/Vegetation classification.

938. **Webb, J. L. 1906**. Some insects injurious to forests. Part II. The western pine-destroying barkbeetle. Bulletin No. 58, Part 2. Washington, DC: U.S. Department of Agriculture, Bureau of Entomology. 30 p. **Size**: 6" x 9".

Notes: A photocopy of an original.
Abstract: This early bulletin describes the following topics as they relate to the western pine beetle: death of pines caused by western pine-destroying barkbeetles; character of the insect and its work; distribution; extent of damage and losses; possibilities of preventing losses; early history of the species; observations by Hopkins, 1899-1904; observations by Burke, 1904; observations by Webb, 1905; methods of combating the insect; and publications relating to the western pine-destroying barkbeetle.
Keywords: Historical document/Bark beetles/Insect control/Insect damage/Insect prevention/Western pine beetle.

939. **Weidman, R. H.; Silcox, Ferdinand A. 1936**. Timber growing and logging practice in ponderosa pine in the Northwest. Technical Bulletin No. 511. Washington, DC: U.S. Department of Agriculture. 91 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin is the last in a series of 12 publications covering forest management practices for various regions of the country. The following topics are discussed: general situation in the northwest pine region, including forest types, timber production, advance regeneration, and logging, slash disposal, and fire protection activities; and measures necessary for continued forest productivity, including recommended practices for slash treatment, fire protection, cutting methods, logging methods, livestock grazing, pest control, erosion control, and rehabilitation of cut-over lands. An appendix describes Dunning's tree classification system and recommended slash treatment methods, and compares minimum and intensive measures of forest management. It provides interesting insights about forest conditions of that era, as illustrated by this quote: "On 40 acres of sample plots in eastern Oregon, on which the ages of all [ponderosa pine] trees above the reproduction class were counted, the age distribution was 9% by number of trees in the class 20-100 years, 22% in the class 100-200 years, and 69 percent in the classes 200-600 years."
Keywords: Ponderosa pine/Pacific Northwest/Eastern Oregon/Eastern Washington/Forest management/Slash treatment/Fire control/Historical document.

940. **Weidman, Robert H. 1921**. Forest succession as a basis of the silviculture of western yellow pine. Journal of Forestry. 19: 877-885. **Notes**: A photocopy of an original.
Abstract: Since the beginning of timber sales on the national forests 15 years before this article was published, the silvicultural system generally used in western yellow pine forests was characterized as selection cutting, often referred to as the "maturity selection system" (see articles by Munger in the history archives for more information about that system). In the beginning, the selection cuts aimed to remove about two-thirds of the virgin stand in the first entry. The silvicultural objective was to cut over the forest rapidly in order to save the decadent timber, to maintain an uneven-aged structure by leaving part of the original stand, and to leave an overwood as a seed source and to provide shelter or protection for young reproduction. By reserving part of the original stand, it was thought that periodic entries could be made at intervals of one-third or one-fourth of the rotation length. Tentatively, a rotation of 180 to 200 years was considered, with a cutting cycle of 40 to 60 years. The objective of this article was to describe the results of studies and observations made over the previous 15 years with respect to the national forests, and up to 50 years for private lands. All of the observations involved yellow pine cuttings in Oregon and Washington only. In general, pure yellow pine forests in that area were characterized as open, irregular or uneven-aged stands with a preponderance of mature and overmature trees, although there was usually an excellent ground cover of advance reproduction made up of dense groups of seedlings established in openings in the forest, but it often consisted of uniformly distributed and suppressed little seedlings struggling along directly beneath the overstory. The suppressed cohort of seedlings established under the overstory was small and inconspicuous, but had a great power of recovery and would respond quickly and favorably after the overstory was removed. The age range of these stands was unbalanced and could scarcely be referred to as uneven-aged. For example, two 20-acre plots from the Whitman NF showed that of all trees 4 inches DBH and greater, 9% was in the 20-100 year class, 22% in the 100-200 year class, 45% in the 200-300 year class, 6% in the 300-400 year class, 15% in the 400-500 year class, and 3% in the 500-600 year class. This meant that 69% of the virgin stands were over 200 years of age (not counting the reproduction less than 4 inches DBH), the maximum rotation age usually considered for yellow pine. On other plots totaling 417 acres, it was found that 67 to 74 percent of the trees were over 12 inches diameter at breast height. These figures showed that unmanaged yellow pine forests had a stand structure that was opposite what would have been expected for a balanced, uneven-aged condition, where the young (small) trees greatly outnumber the old (large) ones. The author then describes old cuttings (50 years previous) on private land near Galena, where the advance reproduction responded after the timber harvest and resulted in an even-aged stand of saplings and poles. As a result of these studies and observations, Weidman comes to the following conclusions: 1) an even-aged successional structure in western yellow pine is an established fact; 2) an even-aged forest is developing on older private cuttings and heavily-cut national forest sale areas regardless of the silvicultural intent; 3) the maturity selection system being practiced was not resulting in a balanced uneven-aged structure, as intended, and it could not do

so based on the ecology of yellow pine; 4) if it was decided to continue the present system (maturity selection cutting), then it should be recognized that a "conversion" structure would result and persist for at least a hundred years before approaching a balanced uneven-aged distribution; and 5) clearcutting, with provision for protection of established advance regeneration, would be an acceptable silvicultural system for yellow pine forests in the Northwest, although four or five seed trees per acre should be reserved as a guard against fire and to seed up any openings created by timber harvest. The seed trees should be reserved for the entire rotation.
Keywords: Clearcutting/Cutover areas/Eastern Oregon/Eastern Washington/Forest management/Historical document/Maturity selection system/Natural regeneration/Ponderosa pine/Second-growth stands/Selection cutting/ Whitman NF.

941. **Weidman, Robert H. 1920**. A study of windfall loss of western yellow pine in selection cuttings fifteen to thirty years old. Journal of Forestry. 18: 616-622. **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: A few years before this article was written, several severe windstorms blew down a large volume of timber in timber sale cuttings in western yellow (ponderosa) pine forests in eastern and southern Oregon. For example, on a 1624-acre cutting unit on the Whitman National Forest in the Blue Mountains of northeastern Oregon, nearly one million board feet of yellow pine timber was blown down during windstorms on May 26, 1913 and September 18, 1914. That volume of blowdown represented 17½ percent of all the reserved trees in the cutting unit. Since the blowdown occurred soon after the sale was completed, there was immediate concern about the longevity of reserve trees and whether partial (selection) cutting could ever be a viable, long-term silvicultural practice based on the high windfall losses experienced in this instance. In order to examine that question, the Forest Service initiated a study where plots were installed in old partial cuttings ranging up to thirty years in age. Plots of various sizes were installed in old cuttings (cut years ranging from 1889 to 1900) located in or near three national forests in the Blue Mountains region of eastern Oregon. The important conclusions from this study were: heavy windfall in the first few years after cutting does not presage the total destruction of the reserve stand or even endanger the method of cutting; losses as high as 25 percent by volume could be expected over the course of 20 years on high windrisk areas; of all the windthrow that could be expected to occur over a long period of years, two-thirds or more of it usually took place in the first four or five years after cutting, with the remainder occurring in rapidly decreasing percentages until about 20 years later when the windfall was so slight as to be negligible; and the selection cutting method was not prohibitive in the yellow pine stands of eastern Oregon based on the heaviest windfall losses encountered in this study.
Keywords: Historical document/Whitman NF/Windthrow/Blue Mountains/Ponderosa pine/Timber harvesting/Selection cutting.

942. **Weigle, W. G.; Frothingham, E. H. 1911**. The aspens: their growth and management. Bulletin No. 93. Washington, DC: U.S. Department of Agriculture, Forest Service. 35 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes aspen forests of the United States, including a discussion of the following topics: the species of aspen and how to distinguish them; wood characteristics; uses for pulp, excelsior, and other products; logging practices; range and distribution of aspen forests; commercial range of aspen; silvics and dendrological characteristics of aspen; stand characteristics; stand development in the Northeastern U.S.; forest management practices for aspen stands; and volume tables (as an appendix).
Keywords: Quaking aspen/Wood characteristics/Silvics/Forest management/Historical document.

943. **Weir, James R. 1918**. Forest disease surveys. Bulletin No. 658. Washington, DC: U.S. Department of Agriculture. 23 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes a process for conducting disease surveys on national forests of the western U.S. The process was based on a procedure first developed and tested on the Deerlodge NF in western Montana. Many common forest diseases found in western Montana are described and illustrated, along with recommendations about how they could be inventoried and mapped during a disease survey.
Keywords: Tree diseases/Montana/Deerlodge NF/Disease surveys/Historical document.

944. **Weir, James R. 1916**. Larch mistletoe: some economic considerations of its injurious effects. Bulletin No. 317. Washington, DC: U.S. Department of Agriculture. 25 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the results of an early study about the effects of dwarf mistletoe *(Arceuthobium laricis)* on western larch forests. The study was conducted on the Whitman National Forest in the Blue Mountains of northeastern Oregon. The life cycle and other characteristics of larch dwarf mistletoe are described, as are its effects on the host trees. Some recommendations for control are also provided.

Keywords: Tree diseases/Larch dwarf mistletoe/Western larch/Blue Mountains/Wallowa-Whitman NF/Historical document/Arceuthobium laricis/Whitman NF.

945. **Weir, James R. 1916**. Mistletoe injury to conifers in the Northwest. Bulletin No. 360. Washington, DC: U.S. Department of Agriculture. 39 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the impacts caused by a variety of dwarf mistletoes on commercial trees of the Pacific Northwest. Much of the information is based on studies conducted on the Whitman National Forest in the Blue Mountains of northeastern Oregon. Many different effects of mistletoe infection are described and illustrated, and inferred relationships between dwarf mistletoe and other insect or disease agents is discussed. Suggestions for mitigation of dwarf mistletoe impacts, including the effects of silvicultural practices on mistletoes, are provided.
Keywords: Tree diseases/Dwarf mistletoes/Pacific Northwest/Wallowa-Whitman NF/Blue Mountains/Historical document/Whitman NF.

946. **Weir, James R. 1918**. Pathological marking regulations. Unpublished Typescript Report. Missoula, MT: U.S. Department of Agriculture, Forest Service, Laboratory of Pathology. 38 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report was designed for timber markers preparing timber sales in District 1 (now Region 1) of the Forest Service. The objective was to provide practical marking rules and to facilitate timber sale contract clauses directed toward sanitation and checking the spread of forest diseases. The goal of the marking rules was to exclude all but thrifty and healthy trees in the residual stand and for retention as seed trees. This paper provides specific disease-prevention recommendations for each of the forest types present in District 1. It includes the following sections: introduction; the objects of marking; the need for forest sanitation; the practical application of pathological marking (by forest type); table of decay determination for standing trees; host index; and bibliography.
Keywords: Disease control/Historical document/Northern Region/Sanitation-salvage cutting/Timber sales/Tree diseases.

947. **Weir, James R. 1916**. Some suggestions on the control of mistletoe in the national forests of the Northwest. Forestry Quarterly. 14 (4): 567-577. **Notes**: A photocopy of an original.
Abstract: Field studies showed a need to take action to control dwarf mistletoe in many of the western national forests. Since timber sales did not generate much revenue, it was difficult to finance sale improvement work using timber sale proceeds. For that reason, an emphasis was placed on practicing silviculture and insect or disease control by how a timber sale was marked, when sanitation, density management, and other treatment objectives could be met indirectly. Weir's concern was that the opposite situation often occurred – heavily-infected trees were left on sale areas because of serious burling and pitch infiltration caused by the mistletoe, even though the trees were merchantable from a size (diameter) standpoint. The concern was not that valuable stumpage or volume was wasted, it was that retention of infected overstory trees resulted in infection of reproduction. The author also questions the fairness of spending large amounts to prevent damage from forest fires, but not being willing to spend funds on disease control, even though it resulted in as much volume loss in the aggregate as fires. The life cycle and infection modes of dwarf mistletoes are described in some detail. He then proposes that mistletoe surveys be made in each forest, since it was possible to correlate dwarf mistletoe infection with forest composition, topography, climate and other factors readily available from existing maps or similar sources. Weir ends this article by reiterating his previous point that it was important to not leave mistletoe-infected reserve trees, since small trees with mistletoe infections on their main stem would never develop into merchantable material.
Keywords: Tree diseases/Dwarf mistletoes/Pacific Northwest/Historical document.

948. **Weir, James R. 1919**. A study of the rots of western white pine. Bulletin No. 799. Washington, DC: U.S. Department of Agriculture. 24 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin reports the results of field studies of the rots in western white pine. The local pathology of western white pine is described, as are the estimated timber volume losses attributable to wood-decay fungi. The study examined the relationship between rots and various factors, such as tree age and size. Some recommendations for the control or minimization of rot-caused damage are provided.
Keywords: Decays/Western white pine/Timber defects/Historical document.

949. **Weitknecht, Robert H. 1915**. Frost damage to larch in the Blue Mountains. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service. 3 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This short report describes a frost damage episode involving western larch during the spring of 1915. An unusually warm April was followed by a rainy and cold May; several killing frosts occurred during May. Larch

needles were only partially-developed and still very tender during the frosts. The result was a generalized killing of larch crowns throughout most of the Blue Mountains. During May and June, the larches presented a brownish appearance that was especially obvious and apparent when the trees were intermixed with the green crowns of other conifers. Most of the larches established new crowns by early summer and then had their normal summer appearance. Where damage was particularly severe, not only the tender needles were killed, but current-year and previous-year shoots were also killed. The author states that no case of a larch tree dying from frost damage was ever observed or reported. At the end of summer, Weitknecht removed increment borings from selected larches growing near Sumpter, Oregon. Of the cores examined, 75% showed a normal annual ring for the present year (1915). The author then recounts comments from Mr. R. M. Evans of the Whitman NF, who described a cold snap that occurred in early June of 1914, when for four days there was a light snowfall at Sumpter, followed by noticeable frost damage to larch crowns. The damage then was not as severe as in 1915 because the larch foliage had hardened off to a greater degree by early June.
Keywords: Blue Mountains/Historical document/Whitman NF/Wallowa-Whitman NF/Western larch/Frost damage/Sumpter OR.

950. **Weitknecht, Robert H. 1915**. Progress report; methods of cutting yellow pine. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Whitman National Forest. 26 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In the yellow pine forests of Oregon, the first extensive cuttings on national forest lands began about 1910. The predominant cutting method was a form of selective cutting in which about 25% of the stand was reserved. That method was considered the best for quick removal of preponderant overmature trees and for the safeguarding of advance reproduction. The study described in this report was initiated in 1914 to examine the effects of the selective cutting that had occurred since about 1910, and to determine if another cutting method would be more effective. A longer report on this study was published in 1916 (see "Study of methods of cutting yellow pine in Oregon" by Weitknecht, a copy of which is present in the history archives). The main objective of the study was to answer silvicultural questions such as these: is accelerated growth after selective cutting important enough to influence the selected cutting method, and would it appreciably shorten the rotation?; how great is the windfall danger in cut-over stands and is there a high risk that all of the reserved trees will eventually be blown down, or does windthrow of reserved trees gradually decrease with time?; does the dense reproduction that exists after cutting start before the cutting or is it a result of natural regeneration that occurs shortly after harvest?; and what is the effect of fire on cut-over stands, especially if some stands were clearcut due to abundant advance regeneration and then subsequently burned by a fire? The field work that formed the basis for this progress report was completed by the author during August and September of 1914. Field work had been scheduled for the whole summer but was cut short due to a lack of funds caused by a fire-related deficit. Field work occurred entirely on cut-over areas located within the Whitman National Forest. This report contains the following sections: manner of conducting the field work; accelerated growth of reserve trees; conclusions – tables I and II; quantity of reproduction; conclusions – table III; height growth of reproduction; conclusions – table IV and figures 1 and 2; and recommendations for field work next season. The report contains four tables and two figures. The author recommends that field work for the following season (1915) be completed by two men working for at least two months. He also recommended that future plots be installed in cuttings considerably older than 10 years, with extra effort made to locate at least two or three cuttings between 30 and 50 years old. Clearcut areas should also receive plots, so that information could be obtained about the source, amount and condition of reproduction.
Keywords: Blue Mountains/Cutover areas/Eastern Oregon/Historical document/Natural regeneration/Selective cutting/Whitman NF.

951. **Weitknecht, Robert H. 1916**. Study of methods of cutting yellow pine in Oregon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 99 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: In the yellow pine forests of Oregon, the first extensive cuttings on national forest lands began about 1910. The predominant cutting method was a form of selective cutting in which about 25% of the stand was reserved. That method was considered the best for quick removal of preponderant overmature trees and for the safeguarding of advance reproduction. The study described in this report was initiated in 1914 to examine the effects of the selective cutting that had occurred since about 1910, and to determine if another cutting method would be more effective. A progress report on one portion of this study was also published in 1917 (see "Yellow pine management study in Oregon in 1916" by Weitknecht, which is present in the history archives). The main objective of the study was to answer silvicultural questions such as these: is accelerated growth after selective cutting important enough to influence the selected cutting method, and would it appreciably shorten the rotation?; how great is the windfall danger in cut-over stands and is there a high risk that all of the reserved trees will eventually be blown down, or

does windthrow of reserved trees gradually decrease with time?; does the dense reproduction that exists after cutting start before the cutting or is it a result of natural regeneration that occurs shortly after harvest?; and what is the effect of fire on cut-over stands, especially if some stands were clearcut due to abundant advance regeneration and then subsequently burned by a fire? The field work for this study was conducted almost entirely on cut-over areas located within the Whitman and Minam National Forests. This report contains the following sections: introduction; reserved trees and accelerated growth; windfall and other loss in reserved trees; reproduction under cutting conditions; reproduction as affected by fire; and conclusion. The report contains numerous tables and several figures. The author concludes that an abundance of advance reproduction in eastern Oregon's yellow pine type would allow either an even-aged or uneven-aged cutting method to be used. An even-aged cutting method would offer advantages in areas where windfall risk was particularly high. However, in many of the cut-over stands the accelerated growth exhibited by reserve trees was greater than losses due to windthrow. And, if clearcutting was selected as the even-aged cutting method, there was always the risk that advance reproduction would be destroyed by fire, resulting in the site sitting "idle" for 15 years or more before trees gradually seeded back in. While the data seemed to show that the yellow pine forests of eastern Oregon were "roughly even-aged," the author believed that the true habit of yellow pine was to occur in many-aged stands. From the results of this study and from personal observations, the author tentatively believed that a cutting method which produced a many-aged stand was the proper one for western yellow pine. The author also stated that the study did not reveal anything that would indicate that the existing cutting method (selective cutting with about 25% of the volume left as reserve trees) was radically out of harmony with the silvical habits and requirements of yellow pine in eastern Oregon.
Keywords: Blue Mountains/Cutover areas/Eastern Oregon/Forest management/Historical document/Natural regeneration/Minam NF/Selective cutting/Timber yields/Whitman NF/Windthrow.

952. **Weitknecht, Robert H. 1917**. Yellow pine management study in Oregon in 1916. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 46 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This was a progress report on one portion of a large study of western yellow pine management. It deals with a permanent sample plot on the Whitman National Forest and a field study conducted on old cut-over areas. The results of the 1916 field season are described in this report; a larger report published in 1916 (see "Study of methods of cutting yellow pine in Oregon," a copy of which is present in the history archives) disclosed the results of the two previous field seasons. The main objectives of the cut-over study were to determine the practical importance of accelerated volume growth after a partial cutting, to investigate loss of trees – particularly by windfall – as it occurs in the years following such a cutting, and to study reproduction in relation to cutting methods. Those objectives were met by the field studies of 1914 and 1915 on the Whitman and Minam National Forests. The purpose of the 1916 field work was to determine if findings from the first two years would also apply to the western part of the Blue Mountains. With that objective in mind, old cuttings on the Ochoco, Malheur, and Whitman National Forests were studied during 1916, with the work accomplished by the author and one field assistant. The report contains the following sections: introduction; accelerated growth of trees in a partial cutting; distribution of accelerated increment; relation of accelerated growth to yield tables; loss by windfall after a partial cutting; reproduction after cutting; reproduction in relation to stock grazing; reproduction problem on land exchange areas; age classes in the yellow pine forest; summary of results obtained in 1916; and present status of study and future work. Some of the results reported in this paper are: 1) accelerated growth in trees after a partial cutting was found to behave exactly the same in the western part of the Blue Mountains as in the eastern part; 2) it was found that accelerated area growth in the individual tree is greatest in the lower portion of the trunk and diminishes with increasing height; 3) for the first time for western yellow pine, yield tables were prepared in this study that make a quantitative allowance for increased growth and loss after cutting; 4) the windfall results of last year's study show that heavy windthrow may occur anywhere in the Blue Mountains, but that some cut-overs have very light windfall losses amounting to less than 2% after 18 to 27 years; 5) it was found that on two 20-acre plots, 73% and 76% of all the yellow pines above 4 inches DBH were over 180 years old; 6) the reproduction on old cuttings in the western part of the Blue Mountains was found to be as uniformly abundant and thrifty as on cuttings elsewhere in the Blue Mountains; 7) although pine reproduction was abundant, it required from 20 to 30 years of gradual seeding and establishment to reach that point; 8) the density of reproduction in older open stands of virgin yellow pine is beginning to affect stock grazing and in a few years will present quite a serious problem; and 9) if large, privately-owned cut-overs near Austin and Whitney are acquired by the Government (via exchange of land for timber stumpage), a policy regarding reproduction on those areas should be adopted immediately. Weitknecht offers some interesting insights, as demonstrated with this quote: "And in open, overmature stands this [yellow pine] reproduction is even now so dense and large in many places as to practically prevent grazing. This advance reproduction has mostly come in during the last 25 or 30 years, and is due to the protection from fire which the forest has received partly by the Forest Service and partly by the unconscious efforts of the settlers and stockmen."

Keywords: Blue Mountains/Cutover areas/Eastern Oregon/Forest management/Historical document/Malheur NF/ Natural regeneration/Ochoco NF/Minam NF/Selective cutting/Timber yields/Whitman NF/Windthrow.

953. **Wernstedt, L. 1906**. View along the main fork of the John Day River. Photo Number 67840. U.S. Department of Agriculture, Forest Service, Umatilla National Forest. **Locality**: Grant County, Oregon. **Size**: 3" x 4½".
Notes: An original copy, mounted on a 7" x 9" hard-card.
Abstract: This is a black-and-white photograph of high quality; the image is in sharp focus throughout. The following information is provided on the back of the hard-card on which the print is mounted – locality: Umatilla National Forest, Grant County, Oregon; date: December 3, 1906; subject: view along the main fork of the John Day River from 2 miles above junction showing edge of timber west of the river; col no.: "38 Wa 41"; relative situation: proposed Blue Mountains addition; direction: S.S.W.; taken by: Wernstedt, L. This photograph appears to have been taken near Spray or Kimberly, Oregon which is just south of the Heppner Ranger District, Umatilla NF. Note that it is likely that this photograph was acquired when the Blue Mountains area was being considered as a forest reserve, hence the reference in the "relative situation" portion of the photo information to a "proposed addition.".
Keywords: Historical photograph/Grant County OR/Umatilla NF/Heppner RD/North Fork John Day River.

954. **Wernstedt, Lage**. **1906**. A favorable report on a proposed addition to the Blue Mountains Forest Reserve. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 18 p. **Notes**: A digital version of this report is available; filename: Bluemtn3. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: This report describes an examination of a 273 square-mile area comprising the headwaters of the North and Middle Forks of the Malheur River in Grant, Malheur, and Baker counties in Oregon. The following topics are discussed: topography, waters, climate; agricultural possibilities; classes of range, forest types, amount of merchantable material; cuttings, roads; cultivated and cultivable lands; alienated lands; grazing; and reasons for recommendation, and arguments against.
Keywords: Historical document/Blue Mountains Forest Reserve/Blue Mountains/Malheur NF/Forest management/Range management.

955. **Western Pine Association**. **1948**. Larch of the western pine region: its properties, uses and grades. A.I.A. File No. 19. Portland, OR: Western Pine Association. 52 p. **Notes**: An original copy.
Abstract: Larch lumber has long been known for its strength, attractive finish appearance and its all-around utility value. For many years its use was limited to areas where the tree grows – in eastern Washington, eastern Oregon, northern Idaho and western Montana. But today larch is being shipped into most of the 48 states and into foreign lands. Production has doubled. More and more wholesalers, dealers and consumers are finding larch profitable to handle, easy to sell, and excellent to use. This booklet is prepared for the dealer and consumer. From the facts contained, sound conclusions may be formed about the properties, uses, and grades of larch lumber.
Keywords: Western larch/Historical document/Wood characteristics.

956. **Westveld, Marinus**. **1951**. Vegetation mapping as a guide to better silviculture. Ecology. 32 (3): 508-517.
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article describes the concepts and principles of vegetation mapping, especially the mapping of climax or potential natural vegetation. Topics discussed include: ecology is the basis for sound silviculture; mapping forest vegetation; determining climax type from current forest cover; determining climax type through site-type classification; development of site-type classification in the Northeast; application of the site-type theory to spruce-fir/ northern hardwood region; and techniques of site-type mapping.
Keywords: Historical document/Forest ecology/Forest mapping/Plant succession/Vegetation classification/Northeastern United States.

957. **Westveld, R. H. 1926**. Preliminary report on brush disposal in the yellow pine region of Washington and Oregon. Unpublished Typescript Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest Experiment Station. 49 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: Disposal of brush (slash) after logging in the western yellow pine (ponderosa pine) forest was a matter of controversy in the early 1900s. The main question centered on economics – was the added expense of brush disposal worth the benefits from a fire protection, insect hazard, and silvicultural standpoint? That some sort of brush disposal is necessary was considered a foregone conclusion – the main question was how much (intensity) and to what extent. This question was particularly important from a silvicultural standpoint, since foresters noticed that young growth (advanced regeneration, residual or seed trees, etc.) was often damaged during piling and burning of

slash, and that natural reproduction was most abundant and most thrifty when established in the protection of brush. To address these concerns and questions, a study was initiated in 1925 on the Deschutes, Crater, Whitman, and Wallowa National Forests to determine the effect of different brush disposal methods on advance and subsequent reproduction. This report presents the preliminary results from that study. It includes the following sections: introduction; scope of the study; composition and character of the yellow pine forest; brush disposal practices; fire lines; intensive fire protection on cut-over lands; brush in relation to fire hazard; silvicultural effects of undisposed brush; brush as a protection against erosion; brush as it affects grazing; entomological aspects of brush disposal; relation of logging to brush disposal; logging damage; and practical applications of brush disposal. Numerous hand-prepared bar charts and tables are also included in this report.
Keywords: Ponderosa pine/Cutover areas/Fire prevention/Historical document/Insect prevention/Logging residue/Slash disposal/Wallowa NF/Wallowa-Whitman NF/Whitman NF/Deschutes NF/Crater NF.

958. **Westveld, R. H. 1927**. Suggestions for a slash disposal policy in the yellow pine forests of the Northwest. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 13 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This paper is the author's remarks at a meeting of the North Pacific Section of the Society of American Foresters on March 25, 1927. It consists of the following sections: introduction; slash as a problem (nature and amount of slash, slash from the standpoint of silviculture, slash in relation to reproduction, slash in relation to the soil, slash in relation to forest sanitation, slash in relation to forest aesthetics, slash from the standpoint of grazing, slash from the standpoint of forest fires, and slash from the standpoint of logging); factors affecting the disposal of slash (silvical habits of the species, and fire risk); methods of slash disposal (piling and burning, swamper burning, broadcast burning, spot burning, strip burning with intensive protection, and non-burning methods); conclusions; and sample slash disposal plan. Disposal of brush (slash) after logging in the western yellow pine (ponderosa pine) forest was a matter of controversy in the early 1900s. The main question centered on economics – was the added expense of brush disposal worth the benefits from a fire protection, insect hazard, and silvicultural standpoint? That some sort of brush disposal is necessary was considered a foregone conclusion – the main question was how much (intensity) and to what extent. This question was particularly important from a silvicultural standpoint, since foresters noticed that young growth (advanced regeneration, residual or seed trees, etc.) was often damaged during piling and burning of slash, and that natural reproduction was most abundant and most thrifty when established in the protection of brush. To address these concerns and questions, a study was initiated in 1925 involving sample areas in Deschutes, Klamath, Crook, Baker, Grant, Whitney, and Wallowa Counties, Oregon, and in Okanogan, Chelan and Kittitas Counties, Washington to determine the effect of different brush disposal methods on advance and subsequent reproduction. This report summarizes the important conclusions from that study, as follows: in general, slash was beneficial to advance reproduction and subsequent reproduction; slash was effective at preventing soil erosion and improving soil fertility; slash disposal was not necessary from the standpoint of forest sanitation; slash disposal was desirable when aesthetics was a factor; slash constituted a dangerous forest fire risk for at least 15 years after a timber sale; forage availability and grazing administration was hindered for about five years after logging; slash decreased logging efficiency only when horse logging was used; slash disposal in yellow pine forest was directed toward maintaining a maximum amount of advance reproduction and reserve trees; the advantages and disadvantages of nine methods of slash disposal are summarized in a tabular format; with the exception of swamper burning, no disposal method reduced the slash fire hazard during logging; and non-disposal had but a single disadvantage when compared with other disposal alternatives – no reduction of the fire hazard.
Keywords: Ponderosa pine/Cutover areas/Fire prevention/Historical document/Insect prevention/Logging residue/Slash disposal/Eastern Oregon/Eastern Washington.

959. **White, Wilfred W. 1924**. Study of Lick Creek timber sale area 15 years after cutting. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service, Bitterroot National Forest. 25 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes conditions on the Lick Creek timber sale area fifteen years after cutting. The Lick Creek sale area, which is located on the Bitterroot National Forest in northwestern Montana, is well known because some camera points were installed as the original sale was being prepared, and then re-photographed at regular intervals. The photographs document dramatic vegetative changes; six photographs showing a progression on one of the camera points were recently made into a poster by the Intermountain Research Station. The Lick Creek sale area covered approximately 2,500 acres and was mostly between the elevations of 4,500 and 5,500 feet. It was on the west side of the Bitterroot River about 6 miles north of Darby and 11 miles south of Hamilton, Montana. Slopes in the sale area were mostly gentle. The original stand was primarily uneven-aged, varying from advance-growth seedlings to trees fully 500 years old. Yellow (ponderosa) pine formed 90% of the original stand, with Douglas-fir making up most of the remainder. A few Engelmann spruce trees occurred along the streams, and unmerchantable

white (grand) fir was found in moist stream bottoms along with limited amounts of lodgepole pine on the upper portion of the area. This report includes the following sections: the sale area and its history (location and natural conditions, brief history and description of cutting); purpose of study and field work methods (purpose, how the field work was done); discussion and results of study (timber cut, estimate of timber cut, timber left standing, diameter growth study along entire tree trunk, increase in merchantable length, DBH growth, crown and opportunity classes, area at BH, volume feet B. M. growth, miscellaneous observations); reproduction; and conclusions. Conclusions of the study included these: diameter growth rates more than doubled on the reserve trees; volume growth rates trebled on the reserve stand; quality increment exceeded quantity increment; Lick Creek was better than average in terms of yellow pine sites in western Montana; loss from windfall was serious but not overwhelming; reproduction was satisfactory considering the reserve stand; selection (partial) cutting methods favor Douglas-fir, but so did fire protection; volume growth increased with the volume left in the form of thrifty trees; areas where 50 or more trees were reserved per acre experienced as much diameter acceleration after cutting as areas where many fewer trees were left; and if the cutting was designed to be light, then it was better to leave the smaller and younger trees, although a large tree could be just as satisfactory to leave for increased growth.
Keywords: Forest management/Historical document/Northwestern Montana/Ponderosa pine/Selection cutting/Silvicultural systems/Stand growth/Timber sales/Tree growth/Bitterroot NF/Repeat photography/Lick Creek.

960. **Whiteside, J. M. 1942**. Report of pine beetle surveys on the Umatilla National Forest, Oregon and Washington, season of 1940 and 1941. Unnumbered Typescript Report. Portland, OR: U.S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, Forest Insect Laboratory. 8 p. **Notes**: An original copy.
Abstract: This report also includes seven memoranda prepared in response to the report, as well as a hand-colored map showing 5 different levels of pine beetle infestation and the location of cut-over areas as of 1940. This short report includes the following sections: introduction; results of the 1941 survey; recent losses; general forest conditions; recommendations; summary; four tables; and one figure (the infestation map described above). The area covered by this report does not include all of the present Umatilla NF; the southern part of the North Fork John Day District was then included in the Whitman National Forest.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect damage/Ponderosa pine/Umatilla NF/Western pine beetle.

961. **Whiteside, J. M.; Wessela, C. P.; Compton, L. M. 1956**. Report of the 1955 Oregon spruce budworm control project. Unnumbered Report. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 61 p. **Notes**: An original copy.
Abstract: This report summarizes results of the 1955 spruce budworm control project, which occurred in the Blue Mountains of northeastern Oregon. There were 620,947 acres sprayed with DDT from June 27 to July 21, 1955. Spraying resulted in 96.9% of the budworm larvae being killed, at a cost of $1.06 per acre. praying occurred on the Ochoco, Malheur, and Wallowa-Whitman National Forests, and involved the Ochoco, Malheur, Susanville, Powder River, Eagle Creek, and Catherine Creek units. This report includes many tables, charts, and photographs.
Keywords: Western spruce budworm/Blue Mountains/Insect control/Insect damage/Malheur NF/Ochoco NF/Wallowa-Whitman NF/Chemical insecticides/DDT/Historical document.

962. **Whiteside, John M. 1956**. Spruce budworm control in Oregon and Washington, 1949–1956. Unnumbered Report. Portland, OR : U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 25 p. **Notes**: A photocopy of an original.
Abstract: While epidemics of the spruce budworm occurred in other areas of North America, a unique situation existed in the states of Oregon and Washington for over a quarter of a century. From 1914, when the budworm was first recorded on Douglas-fir at Ashland, Oregon, to 1943 when the first extensive outbreak developed in northeastern Washington, only small, localized, and widely separated outbreaks were found in the eastern parts of the two states. All of those outbreaks subsided from natural causes and without significant amounts of tree mortality. The report goes on to describe a treatment program in which more than $4,000,000 was spent to treat 3,840,000 acres of budworm-infested forest between 1949 and 1955.
Keywords: Western spruce budworm/Insect damage/Chemical insecticides/Aerial spraying/DDT/Benzene/Hexachloride/Toxaphene/Insect control/Historical document.

963. **Whitfield, C. J. 1933**. The vegetation of the Pike's Peak region. Ecological Monographs. 3 (1): 75-105.
Notes: A photocopy of an original.
Abstract: This article provides a detailed account of vegetation conditions in the southern Front Range of Colorado near Pikes Peak, the easternmost peak in Colorado's Rocky Mountains that rises to 14,000 feet or higher (note that Pikes Peak is contained in the Pike and San Isabel National Forests of south-central Colorado). The following top-

ics are discussed: introduction (description of area, etc.); vegetation (descriptions by life zones); physical factors (temperature, humidity, wind, precipitation, etc.); ecological anatomy (leaf structure and stomatal distribution); function (transpiration and osmotic values); summary and correlation; and a bibliography. Many maps, photographs, charts, and drawings are contained in this paper.
Keywords: Central Rocky Mountains/Colorado/Forest ecology/Front Range CO/Historical document/Mountain climate/Vegetational zonation/Pikes Peak/Pike and San Isabel NF.

964. **Whittaker, R. H. 1953**. A consideration of climax theory: the climax as a population and pattern. Ecological Monographs. 23 (1): 41-78. **Notes**: A photocopy of an original.
Abstract: This is a long and extremely detailed article describing the history of the climax theory in plant ecology, not just for American ecology (Cowles, Clements, Cooper, etc.) but also for the European antecedents (Swiss, French, German, Scandinavian, etc.). It provides a comprehensive history and overview of an important ecological concept that has served as the foundation for many vegetation classification efforts in the western United States (Daubenmire's pioneering work in northern Idaho and northeastern Washington is a good example, leading to similar efforts by Pfister for western Montana, Steele for central Idaho, etc.). The article includes the following sections: introduction; evidence; succession and retrogression; characteristics of the climax; interpretation of evidence and criticism of the monoclimax; formulations of climax theory and logic; application; conclusion; summary; and literature cited. Whittaker summarized his thoughts as "change in environment implies change in the community pattern; and along a continuous environmental gradient, community composition will usually change continuously." Because of his beliefs regarding the universality of change, Whittaker maintained that Clements' viewpoint of a climatic or monoclimax (single end-point) theory of climax was untenable. However, he ends by stating that "for all its subjectivity and relativity, the climax concept has real meaning and usefulness."
Keywords: Historical document/Climax vegetation/Frederic Clements/Plant ecology/Plant succession/Plant communities.

965. **Willey, Day Allen**. **1909**. Ferocity of forest fires. Pacific Monthly. 22 (5 (Nov.)): 464-475.
Notes: A photocopy of an original.
Abstract: Author describes some effects of enormous forest fires in general, and the effects of large fires that burned during 1908 in particular. A fire near Metz, Michigan is described in great detail, including an attempt to evacuate the town by train as the fire began burning homes in the town. Unfortunately, the train arrived too late and, as it tried to flee the area loaded with evacuees, plunged into a ravine in an area where the fire had burned the trestle and railroad ties supporting the tracks. At least 20 people were known to have been killed in that accident, and the entire town was destroyed by the fire. Similar fire tragedies are described for Hinckly, Minnesota, Chisholm, Minnesota, Pottawatomie, Kansas, and the San Jacinto Mountain Forest Reserve in southern California.
Keywords: Historical document/Fire control/Fire effects/Fire fighting/Fire prevention/Forest fires/Fire history.

966. **Williams, Glyndwr**. **1971**. Peter Skene Ogden's Snake Country journals; 1827-28 and 1828-29. London, U.K.: The Hudson's Bay Record Society. 5 p. **Notes**: A photocopy of an original.
Abstract: In 1950, the Hudson's Bay Record Society began publishing Peter Skene Ogden's Snake Country journals (see Rich and Johnson 1950 for an excerpt from that work). Ogden's journals gradually became an important source of early history about the American West. This accession consists of selected pages copied from a larger work. It provides journal material from an early fur trapper who was persistent and resourceful in his pursuit of beaver. Ogden worked for the Hudson Bay Company, who controlled much of the beaver trade in western North America. He was characterized as a shrewd observer of human nature, based on his comments about his party members, the American Indians he met, and upon himself. Pages 160-165 describe Ogden's travels as he headed north from Harney Lake up the Silvies River, Emigrant Creek, the South Fork of the John Day River, and the main stem of the John Day River to Kimberly, and from there he went northeast along the North Fork of the John Day River to Dale, Oregon. This section covers journal entries from Friday, June 17th, 1829 to Monday, July 4th, 1829 when he was beyond Kimberly, Oregon. The journal entries in this material recount climatic conditions, beaver trapping activities, big-game accounts (including grizzly bear encounters), and interactions with American Indians.
Keywords: Eastern Oregon/Historical document/Explorer journals/Peter Ogden/Fur trapping/Hudson Bay Company.

967. **Williams, Hubert C. 1912**. Annual silvical report for the Idaho National Forest. Unpublished Typescript Report. [Place of publication unknown]: [U.S. Department of Agriculture, Forest Service]. 42 p.
Notes: A digital version of this report is available; filename: Idaho1. Copied from Research Compilation File material on microfilm at the University of Washington Libraries in Seattle.
Abstract: Discusses the vegetation and general characteristics of the Idaho National Forest (much of which is now

included within the Boise National Forest?). The following topics are described: list of trees, list of shrubs, forest types (yellow pine, yellow pine and red fir, balsam- spruce, lodgepole pine, alpine, grassland, and barrens types). The balance of the report provides silvical descriptions of each forest type, as well as the silvics of each individual species, in which the description, habitat, growth, reproduction, and dangers and diseases are discussed. The following species are described: yellow (ponderosa) pine, lodgepole pine, limber pine, tamarack (western larch), Engelmann spruce, Douglas fir, white (grand) fir, subalpine fir, black cottonwood, quaking aspen, common juniper, water birch, thinleaf alder, mountain ash, Douglas hawthorne, mountain mahogany, buckthorne, serviceberry, cherry, and willow. Species are ranked in terms of soil and moisture requirements, shade tolerance, and susceptibility to damage from lightning. The effect of grazing on forest conditions is described, as is the condition of forest reproduction on cut-over lands. The final section of the report (4 pages) provides black-and-white photographs of the Forest.
Keywords: Historical document/Idaho NF/Southern Idaho/Silvics/Forest types/Ponderosa pine/Lodgepole pine/Limber pine/Western larch/Engelmann spruce/Douglas-fir/White fir/Subalpine fir/Black cottonwood/Quaking aspen/Common juniper/Water birch/Thinleaf alder/Mountain ash/Douglas hawthorne/Mountain mahogany/Buckthorne/Serviceberry/Cherry/Willows.

968. **Wilson, James**. **1905**. Memorandum regarding an act to transfer the Forest Reserves. Unpublished Typescript Memorandum. Washington, DC: U.S. Department of Agriculture, Office of the Secretary. 5 p.
Notes: A photocopy of an original.
Abstract: This accession consists of a memorandum from the Secretary of Agriculture to the Forester (Chief) of the Forest Service. It is dated February 1, 1905. It describes an act that had just been signed by the President of the United States that provided for the transfer of forest reserves from the Department of the Interior to the Department of Agriculture. The act also stipulated that forest supervisors and rangers shall be selected, when practicable, from qualified citizens of the states or territories in which the said reserves are situated. Further, all money received from the sale of any products or the use of any lands in the reserves was to be deposited into the Treasury and for five years after the passage of the act was to constitute a special fund for the protection, administration, improvement, and extension of Federal forest reserves. The author also refers to an executive order of December 17, 1904 that classified the whole forest reserve service and placed it under the Civil Service Law. Wilson also reiterated that "in the administration of the forest reserves it must be clearly borne in mind that all land is to be devoted to its most productive use for the permanent good of the whole people and not for the temporary benefit of individuals or companies. All the resources of forest reserves are for use, and this use must be brought about in a thoroughly prompt and businesslike manner, under such restrictions only as will insure the permanence of these resources. You will see to it that the water, wood, and forage of the reserves are conserved and wisely used for the benefit of the home-builder first of all; upon whom depends the best permanent use of lands and resources alike. In the management of each reserve local questions will be decided upon local grounds; the dominant industry will be considered first, but with as little restriction to minor industries as may be possible; and where conflicting interests must be reconciled, the question will always be decided from the standpoint of the greatest good of the greatest number in the long run." Based on the similarity to other writings by Gifford Pinchot, I assume that this memorandum may have been written by Pinchot for the Secretary's signature.
Keywords: Forest reserves/Forest history/Historical document/Gifford Pinchot.

969. **Wohletz, Ernest; Ravenscroft, Vernon**. **1948**. Cold-soak wood preservation. Moscow, ID: University of Idaho, School of Forestry. 47 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: The cold-soak preservaton method with pentachlorophenol ("penta" for short) given in this bulletin can save Idaho farmers $383,000 per year on their fence post bill alone. The estimated average life of the treated posts was 15 years. The total treatment cost was 5 cents per post.
Keywords: Fence posts/Wood decay/Historical document/Wood preservation/Penta/Pentachlorophenol.

970. **Woolsey, Theodore S., Jr. 1911**. Western yellow pine in Arizona and New Mexico. Bulletin 101. Washington, DC: U.S. Department of Agriculture, Forest Service. 64 p. **Size**: 6" x 9".
Notes: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin describes the following as related to ponderosa pine in the Southwestern United States: characteristics of the tree itself (size, root system, tolerance, susceptibility to injurious agents, growth, etc.); characteristics of pine stands and the forest type; timber yields; wood characteristics and its uses; lumbering practices in the Southwest; markets for ponderosa pine; management of ponderosa pine on the National Forests; and conservative lumbering practices on private land.
Keywords: Ponderosa pine/Southwestern United States/Arizona/New Mexico/Timber yields/Wood characteristics/Forest management/Timber harvesting/Historical document.

971. **Worthington, Norman P.; Staebler, George R. 1961**. Commercial thinning of Douglas-fir in the Pacific Northwest. Technical Bulletin No. 1230. Washington, DC: U.S. Department of Agriculture, Forest Service. 124 p. **Size**: 6" x 9". **Notes**: An original copy.
Abstract: Thinning is characterized by varying degrees of intensity. As a purely silvicultural measure, it is independent of disposition of material removed. From a practical viewpoint, not only must thinning have a salutory effect on the stand, but the wood removed must also have a value. Going one step farther, if the value of material removed equals or exceeds cost of extraction, the thinnings are classed as "commercial". Commercial thinning as used in this bulletin is defined as "a thinning that produces merchantable products that have a value equal to or greater than the cost of extraction." It is natural in the evolution of forestry that commercial thinning should be the first kind of thinning extensively practiced. Although precommercial thinning may be very worthwhile, its ultimate economic value is more difficult to assess and the practice is likely to be slowly accepted.
Keywords: Commercial thinning/Douglas-fir/Pacific Northwest/Timber management/Silvicultural systems/Historical document.

972. **Yerkes, Guy E. 1932**. Propagation of trees and shrubs. Farmers' Bulletin No. 1567. Washington, DC: U.S. Department of Agriculture. 52 p. **Size**: 6" x 9".
Notes: An original copy. Issued in April, 1929; this version is a slight revision released in February, 1932.
Abstract: This bulletin briefly describes some of the methods used for propagation of deciduous fruit trees, as well as a number of the trees and shrubs used for landscaping around the home or farm. Practical details are presented about the care and handling of tree seeds, seedling culture, handling of cuttings, layers, grafts, and buds, and other considerations of woody- plant propagation. The bulletin contains the following sections: introduction; propagation by seeds; propagation by cuttings; propagation by layers; propagation by grafting and budding; and propagation of specific kinds of ornamental trees and shrubs.
Keywords: Artificial regeneration/Historical document/Nursery practices/Seed processing/Seedling transplanting/Tree planting.

973. **Young, F. G. 1902**. The archives of Oregon. Oregon Historical Quarterly. (December): 371-389.
Notes: A photocopy of an original.
Abstract: This article discusses sections of the Oregon Constitution, and codes and statutes, that allow for retention, organization, and cataloguing of historically valuable archives. This article describes some very early sources of Oregon archives, most of which pertain to Oregon government and territorial administration.
Keywords: Historical document/Oregon history.

974. **Young, F. G. 1899**. The correspondence and journals of Captain Nathaniel J. Wyeth, 1831-6. Sources of the History of Oregon. 1 (3 to 6 inclusive): 155-251.
Notes: A photocopy of an original. Published by University Press, Eugene, Oregon.
Abstract: This article was described as a "continuation of the contributions of the Department of Economics and History of the University of Oregon by the Oregon Historical Society." The editor, F. G. Young, was shown as Secretary of the Oregon Historical Society. The subtitle of this article is: "a record of two expeditions for the occupation of the Oregon country, with maps, introduction and index." This article provides a copy of Wyeth's journals, which provide a day-by-day account of his locations and activities. His first expedition left Independence, Missouri on May 3, 1832; there is no date shown for the second expedition.
Keywords: Historical document/Oregon history/Nathaniel Wyeth/Explorer journals.

975. **Young, F. G. 1904**. Literary remains of David Douglas, botanist of the Oregon country. Oregon Historical Quarterly. 5 (3 (Sept)): 215-222. **Notes**: A photocopy of an original.
Abstract: This article provides "editorial prefatory notes" to a more exhaustive presentation of David Douglas's diaries and journals in subsequent issues of the journal. This article covers the following topics: general schedule of Douglas's movements; and an outline of his explorations. Since this article was not intended to provide actual material from Douglas's journals, no such excerpts or other use of those materials are presented here.
Keywords: Botany/Historical document/Pacific Northwest/Forest history/David Douglas/Explorer journals.

976. **Ziegler, E. A. 1907**. Forest tables – lodgepole pine. Circular 126. Washington, DC: U.S. Department of Agriculture, Forest Service. 24 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin provides a collection of tables concerned with lodgepole pine forests, including stand tables, reproduction tables, height tables, growth tables, volume tables (board feet, cubic feet, box boards, and ties and props), form tables, and yield tables.
Keywords: Volume tables/Lodgepole pine/Timber yields/Forest measurements/Historical document.

977. **Ziegler, E. A. 1908**. Forest tables – western yellow pine. Circular 127. Washington, DC: U.S. Department of Agriculture, Forest Service. 23 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin is a compilation of tables concerning ponderosa pine forests, including the following: stand tables, height tables, clear length tables, growth tables (height and diameter), volume tables (board feet, cubic feet, bark), and form tables.
Keywords: Volume tables/Timber yields/Ponderosa pine/Forest measurements/Historical document.

978. **Zon, Raphael**. **1915**. Native shrubs and herbaceous plants as indicators of planting sites, Ephraim Canyon. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 7 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This report describes how native, non-tree vegetation could be used during selection of planting sites in an area that has been stripped of its natural forest cover. It was prepared for an area on the Manti National Forest in central Utah, and is indicative or representative of early ecological work completed by the U.S. Forest Service in the western United States. If remnants of the original forest cover could be located in a denuded area, it was possible to use it as an indicator of which species to plant. Often, however, site conditions were changed so dramatically by timber harvesting and subsequent fire that the remnant species were not suitable as an indicator of what to plant. For example, if a Douglas-fir stand was cut and burned, the site conditions are more suitable for planting yellow pine than Douglas-fir. When the original coniferous forest cover had disappeared completely as a result of severe burns and grazing, having been replaced with shrubs, herbaceous vegetation, and quaking aspen, the question of which species to use for replanting became more difficult. In that situation, the shrubs, herbaceous vegetation, and aspen should provide clues about potential reforestation species. Since the native vegetation reflected the aggregate effect of climatic, soil, topographic, and physical characteristics of a site, it was considered to be a better indicator than using any individual criterion. For the purposes of planting, Zon divided Ephraim Canyon into five vegetational belts or zones. The upper and lower elevational limits of those zones varied by slope exposure, with the limits being slightly higher on south aspects and slightly lower than average on northerly exposures. The five belts were: the lower timberless belt; the yellow pine belt; the Douglas-fir belt; the Engelmann spruce belt; and the upper timberless belt. The lower timberless belt was characterized by sagebrush, rabbitbrush, wild apple, cheat grass, pinyon pine, and junipers. Wherever these species were dominant, planting of "timber" trees was not recommended. The yellow pine belt included rose bush, june berry (serviceberry), deer brush (snowberry), manzanita, birch, barberry (Oregon grape), Gambel oak, bitterbrush, mountain mahogany, and sumac. When these plants were predominant, it was recommended that western yellow pine be planted. The Douglas-fir belt was characterized by an abundance of barberry, deer brush, mountain elder, aspen, mountain myrtle (pachystima), and ninebark. It was recommended that Douglas-fir be planted on sites dominated by this suite of species. The Engelmann spruce belt included deer brush, aspen, mountain myrtle, cone flower, mountain currant, and mountain elder. Alpine fir may be very much in evidence. Engelmann spruce was the recommended species to be planted on those sites. The upper timberless belt was characterized by yellow brush, limber pine, and dwarf willow in terms of areas where continuous forest cover was no longer possible. Although small groups of spruce and fir may occasionally occur in that zone, the predominant vegetation type is alpine meadow dominated by wheat grasses and wild timothy. No planting was recommended for this zone, unless it was protection planting of elder, gooseberry, or alpine grasses for prevention of soil erosion. In addition to these five belts, the excellent diagram which accompanies this report shows a lodgepole pine zone. While lodgepole pine did not occur naturally in the canyon, the author thought it might be possible to use it in a planting program as long as it was used only in the transition between the Douglas-fir and Engelmann spruce belts. Western yellow pine was also very rare in the canyon, but the presence of the indicator vegetation suggested that it could be planted in many areas at low to moderate elevations. While the diagram and this report were developed for Ephraim Canyon, Zon believed that they were also applicable to other canyons on the west slope of the Wasatch Mountains. The last page is a diagram entitled "Native shrubs and herbaceous plants as indicators of potential natural timber belts, Ephraim Canyon, Manti National Forest."
Keywords: Forest ecology/Historical document/Indicator plants/Vegetation classification/Utah/Ephraim Canyon.

979. **Zon, Raphael**. **1916**. A new classification of the native vegetation of the United States into natural groups. Unpublished Typescript Report. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 17 p. **Notes**: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This accession consists of the remarks delivered by the author at a meeting of the Society of American Foresters on December 29, 1916, which was held in connection with the Convocation of the American Association for the Advancement of Science in New York, December 26-30, 1916. It begins by stating that the great climatic, physiographic, and topographic variety of the United States has produced one of the richest and most varied forests of any temperate region in the world. The task of describing and giving a clear idea of the forests of this country was very difficult, yet in all this chaos of seemingly unrelated forest units, there was a definite relationship, system,

and order. There have been many attempts to group the forests of the United States into broad units. A natural grouping of forest vegetation into a few fundamental units would not only facilitate the work of the botanist and the forester, but would also help the geographer in the natural division of the country into climatic, physiographic, or soil regions. After all, forest growth was the expression of the climatic and physical factors of the environment – it reflects the climate, topography, and soil of a particular region. Zon believed that the western forests could be reduced to three broad forest types – western yellow pine-Douglas-fir, cedar-hemlock, and spruce-fir; and two woodland types – pinon-juniper, and chaparral. In the eastern United States, forest formations were not as sharply delineated due to the less pronounced physiography. He recognized 6 natural formations in the eastern U.S. – boreal coniferous forests of spruce-fir which were very similar to those of the West; the great northern pineries of the Lake States and northern New England; the beech-maple-hemlock forests of the northern Lake States and New England; the great oak formation consisting of four subunits: chestnut-chestnut oak-yellow poplar, oak-hickory, oak-shortleaf pine, and cypress-red gum-tupelo and other river bottom hardwoods; the southern pine region; and the subtropical mangrove forests indigenous to southern Florida. This paper ends with a long table entitled "Division of forest formations into associations and types." It includes the following categories of information: formation; association; type; and site.
Keywords: Forest inventory/Forest mapping/Historical document/Land classification/Forest types/United States.

980. **Zon, Raphael**. **1907**. A new explanation of the tolerance and intolerance of trees. Proceedings of the Society of American Foresters. 2: 79-94. **Notes**: A photocopy of an original.
Abstract: Many silvicultural facts are ascribed to the tolerance or intolerance of tree species. The author describes the history of the tolerance concept, which was first formulated in Europe by Pfeil and Gustav Heyer. However, Zon states that Pfeil's work in Germany was based on personal observation and had never been scientifically tested, even though his observations quickly became dogma and were widely incorporated in the forestry textbooks of the time. Zon noted that trees tend to develop differently depending on whether they are growing in full sunlight or shade. Those differences were related more to the environment than they were to species; in other words, the physiological changes observed in a shade-tolerant species growing in full sunlight were similar to those noted for a shade-intolerant species. Zon also noted that some changes in foliage and physiology seemed to be based solely on environmental factors such as soil moisture or atmospheric humidity. He then described trenching experiments where ditches or trenches were dug through plots such that the roots of neighboring trees were not able to affect the growth of established seedlings. The seedling response to the treatment clearly showed that most of the overstory's impact on the understory was derived from root competition, not from light suppression. Zon closes by recommending that we think of a tree as a long pole with a mass of branches at each end, one of which is in the atmosphere, the other in the ground. He believes we've ignored the set in the ground for much too long and should admit that we've spent entirely too much time looking up rather than looking down.
Keywords: Forest ecology/Historical document/Tree physiology/Shade tolerance.

981. **Zon, Raphael**. **1914**. Review of Ueber Waldtypen (forest types). Proceedings of the Society of American Foresters. 9: 119-125. **Notes:** Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This article is a review of a Swedish text concerned with forest associations. The text, authored by professor A. K. Cajander, describes a very early application of a concept similar to what the Daubenmire's would eventually develop as habitat types in the western United States. The text's author describes forests in Germany, which are delineated using 3 main classes of undergrowth vegetation. Those classes are sometimes divided into subclasses, once again using undergrowth plants as indicators of the new type. Although it is believed that the differences in undergrowth composition are reflective of soil differences, all delineation of the types is based strictly on floristics rather than soils. Zon, a prominent ecologist employed by the U.S. Forest Service, does not believe that the concept is workable because undergrowth plants are believed to be too easily affected by variable conditions such as stand density. However, Zon recommends certain sections of the book, especially the last chapter dealing with delineation of forest types.
Keywords: Forest ecology/Forest types/European forestry/Historical document/Indicator plants/Plant succession/ Vegetation classification.

982. **Zon, Raphael**. **1915**. Seed production of western white pine. Bulletin No. 210. Washington, DC: U.S. Department of Agriculture. 15 p. **Size**: 6" x 9". **Notes**: Copied 2 pages side by side on 8½" x 11" paper.
Abstract: This bulletin discusses the following topics regarding western white pine seed production: determination of seed crops, determination of seed periodicity, external and internal factors affecting seed production, and the biological aspects of seed production.
Keywords: Western white pine/Seed crops/Historical document.

983. **Zon, Raphael; Cecil, George H.; Hopkins, A. D. 1909**. Memoranda regarding identification of mountain pine beetle on the Wallowa National Forest. Unpublished Typescript Memoranda. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service. 6 p.
Notes: A photocopy of an original located at the National Archives in College Park, Maryland.
Abstract: This is a collection of three memoranda that relate to identification of mountain pine beetle on the Wallowa National Forest in northeastern Oregon. The oldest memorandum, signed by A. D. Hopkins of the USDA Bureau of Entomology, was dated February 18, 1907 and addressed to The Forester, care of Raphael Zon, in Washington DC. It mentions depradations caused by bark beetles in the lodgepole pine type on the Wallowa. As a result of a memo that Hopkins received on January 9th, he wrote to request that specimens of the beetles be collected and returned to him for definitive identification. A collection was made, and the specimens received by Hopkins on February 14th. The memorandum of February 18th was to notify The Forester (Chief of the Forest Service) that the beetles were identified as *Dendroctonus monticola*, the mountain pine beetle. Hopkins mentioned that they had studied the beetle in considerable detail and that a circular (publication) describing the insect and its control would be released in the near future. Hopkins also provides some control recommendations in the memo, stating that "it is necessary that at least seventy-five percent of the insects in the infested trees should be destroyed during the period between the middle of October and the middle of the following June." He goes on to describe several alternative control methods, including use of a forest fire to kill beetles (and their host trees) in large infestations. The second memorandum, prepared by George H. Cecil, Acting District (Regional) Forester for District 6, was addressed to The Forester and dated November 6, 1909. It describes some bark beetle specimens that were forwarded to Dr. Hopkins from a yellow (ponderosa) pine tree in the T. W. Odell timber sale. The actual collection was made in section 18, Township 7 S., Range 47 E. in the Wallowa National Forest. Cecil mentions that yellow pines in that area had only recently been attacked, but that large areas of lodgepole pine had been destroyed over the last 5 years. Cecil mentions that the damage to lodgepole was not viewed as a serious problem due to the low value of the species, its general remoteness, and the fact that it was being replaced by western larch in the affected areas. Damage to the commercially-valuable yellow pine was considered very important, however. The third memo, prepared by Raphael Zon, was addressed to A. D. Hopkins and dated November 12, 1909. It acknowledges a memo from Hopkins on October 27th, and a reply to Hopkins from a Mr. Allen on November 2nd. Zon's memo recapitulates Cecil's memo of November 6th, quoting virtually all of the text in this memorandum. Zon asks that Hopkins provide any information about the insects and their control directly to Cecil.
Keywords: Bark beetles/Dendroctonus/Historical document/Insect control/Insect damage/Lodgepole pine/Mountain pine beetle/Northeastern Oregon/Ponderosa pine/Wallowa NF/Wallowa-Whitman NF.