1928 BURN

REFORESTATION SURVEY

1963 Fiscal Year

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1928 BURN REFORESTATION

SURVEY

Heppner Ranger District

I. INTRODUCTION

In 1928, approximately 28,000 acres of timber and grassland was burned over. Characteristically of large burns, some areas burned extremely hot and consumed both standing green timber and dead and down logs completely. On most of the burned area, however, only the flash fuels were consumed leaving the timber stand materially undamaged.

Reforestation efforts were made on some of the areas which were completely denuded by fire beginning in 1949. The degree of success varies from complete failure to moderate stocking.

It is significant to mention that failure was attributed to drought, deer damage, domestic grazing and competition from Snowbrush ceanothus (Ceanothus velutinous) and other vegetative competition of the seral stages of succession. Plantations situated on north aspects, especially on slopes of 20% or greater had the highest stocking per acre. Plantations on south aspects of all slopes were failures in most cases.

II. COORDINATION WITH OTHER USES

According to the Heppner District Multiple Use Plan, the areas reforested within this burn and the areas included in this survey are commercial forest lands. Some of the vegetation which has come in on the severely burned spots constitutes important wildlife forage. The area surveyed is entirely within a domestic livestock allotment and is approximately 0.65% of the total acres of the allotment (Collins Butte S&G). The area receives heavy recreation use, principally in the form of hunting. The watershed value of this area is moderate. Most of the precipitation and soil moisture is not available after May.

For simplicity in presenting the survey findings, we have divided this area into two areas by priority. The number one priority is shown as green on the attached map and the number two priority is shown in orange.

III. ORGANIZATION OF THE SURVEY

A. A reconnaissance was made of the 1928 Burn from two approaches.

1. Plantation reports were scrutinized and plantations reported in recent examinations as having inadequate stocking were selected for detailed re-examination.

2. The district personnel contributed information about areas they had seen while on trips to the field that might be useful in locating areas to be considered for reforestation.

B. From these sources, three areas were selected for field observations.

1. HEPPNER – BIG WALL PLANTATION, P-5 Spring 1952
This plantation was not a failure, however, considerable porcupine damage threatens it. (See map attached.)

2. HEPPNER – BIG WALL PLANTATION, P-3 & P-4
Upon examination of these two plantations, we discovered that adequate stocking has been obtained both through natural and artificial regeneration. (See map attached.)

3. HEPPNER KAHLER PLANTATION, P-2
This area constitutes a plantation failure. There is no evidence of artificially established seedlings within this area except on steep north aspects. This area was selected for detailed survey and is the subject for the balance of this report. (See field map sheets attached.)

IV. THE SURVEY

The area surveyed is located in Sections 27, 34 and 35, T.7S., R. 25E., Willamette Meridian, and constitutes a total of 122 acres. Elevation ranges from 3,000 feet to 3,500 feet above sea level.

For simplicity in presenting this report, the areas have been divided first by location into areas A and B, and second, by priority 1 and 2. Priority 1 represents the areas with the best potential and planting conditions. Priority 2 represents the areas that have shallower soils, less favorable aspects and so forth.

Area A. (Deadhorse Creek – Section 27)

–Priority 1 (A-1 on the attached field map sheets)

Observations:

1. Stocking – This unit is obviously non-stocked. An occasional seedling from 3-7 years old is visible on the slope in the N.E. corner of the unit and also along the road on the west side of the unit. A stocking survey was not found to be necessary.

2. Vegetative cover – A random sample was taken using plots 4 milacres in size spaced at intervals of 50 feet to determine the extent of the vegetative cover. Approximately 5% of the area was sampled. Approximately 35% of the crown cover is occupied by Ceanothus velutinous. Annual grasses and perennial grasses and forbs compose the remaining portion of the ground cover. Annual grasses present were primarily annual Bromes and perennial grasses were Fescues and in some spots Agropyrons. Vegetation on the steep north slopes in this unit consists primarily of Ceanothus and Snowberry.

3. Soils – Soil sample pits were dug to determine soil depth, horizon development, nature of the C horizon and depth to moisture. (See attached Kodachrome slides in packet.) These samples were taken on October 22, 1962, and at this time the tolo soils were saturated to an average depth of 24 inches from recent precipitation. Moisture was found as far into the calcareous "C" horizon of the Klicker soils as we could dig (approximately 18 inches).

   The tolo soils are situated along the lower portions of this unit on the gentle slopes next to the creek bottom. These soils are deep with a weakly developed "A" and "B" horizon approximately ½ inch in depth.

   The Klicker soils are situated on the southwest slopes. Most of the "A" horizon has been eroded away and an erosion pavement is developing. Some of the Klicker soils are found in transition into an unidentified soil on the steep north and east slopes. The soils in the Klicker series and the soils on the steep north and east slopes have a well developed calcareous "C" horizon. (See photos attached). The calcareous material is blocky and angular in shape and has a silty texture. It can be carved easily with a pocket knife. The soils on the north slopes are shallow and have large stones near the surface.

4. Timber site classification – Three 1/5 acre plots were sampled, each in the following manner:

   a. Two dominants were selected and the following measurements taken:

      1) DBH

      2) Increment to determine age

      3) Height

   b. Three co-dominants were selected and the same measurements taken as for a. above.

   The three 1/5 acre plot measurements were averaged and the site was determined by applying the average measurements to Harmon's Site

Classification Table. The result indicates that this site is a site IV. The average measurements are as follows:

a) Ave. DBH = 12.3 inches

b) Ave. Height = 64 feet

c) Ave. Age = 74 years

5. Terrain – The plantable soils within the area are located on slopes of from 5 to 30%. The majority of these soils are on slopes of approximately 15%.

6. Accessibility – A road serves the area. However, for spring planting, the road may not be passable early enough since par of it passes through and along cultivated fields. Planting equipment and supplies could be transported to the area by pack horse (approximately one mile). This area is approximately 30 miles from Tupper Work Center by road.

7. Improvements – The only know improvement (not including the road) in the area is the fence that is located on the forest boundary. This fence is a barbed, three wire fence.

–Priority 2 (A-2 on the attached field map sheets)

This area differs from area A-1 primarily because the soils are all shallow (6-14 inches) Klicker soils on south aspects. Vegetative cover is principally Ceanothus and annual grasses, however, the crown cover is not as dense or extensive as for the A-1 unit. The area in the northeast ¼ of Section 27 has some old growth timber and a partial shrub cover of Snowberry.

Area B. (Section 34 & 35)

–Priority 1 (B-1 on the attached field map sheets)

Observations:

1. Stocking – This unit is not adequately stocked. However, enough seedlings have survived original planting that only fill-in planting would be necessary. A stocking survey was not necessary because the area is obviously non-stocked.

2. Vegetative cover – The species composition is comparable to Area A. The crown cover of Ceanothus is not as well developed as for area no. 1, however. Most of the Ceanothus plants have smaller crowns. Douglas fir made up a larger portion of the timber stand prior to the fire in this area than for Area A – 1 & 2.

3. Soils – The soils are of the same description as for Area A.

4. Timber site classification – This site is a site IV.

5. Terrain – The slopes range from 0 to 25% and the aspect is generally north and east.

6. Accessibility – A road ends approximately ¼ of a mile from this area. Planting equipment and supplies would have to be carried in by pack horse or by crew members. It is 30 miles by road from Tupper Work Center to this area.

7. Improvements – There are no improvements within the area.

Priority 2 (B-2 on the attached field map sheets)

This area is of the same general description as the area A-2 previously described in this report.

V. SUMMARY

There are 82 acres of Priority 1 planting areas and 40 acres of Priority 2 planting areas. The prime difference between these areas is the fact that the Priority 2 areas are on south aspects and the soils are shallower. Successful planting of these shallow soils facing the south would require protection beyond that necessary for the Priority 1 areas. The soils are plantable, however, and the timber site is one of the better sites on the Heppner Ranger District. The Priority 1 areas can be planted and at a reasonable cost per acre. The decision to plant will have to be based on the evaluation of the Range and Wildlife resource that might be adversely affected by reduction in Browse, the watershed value which could be improved by tree planting, the timber production that could be realized in the area from intensive management (which is sure to come in the future) and other factors.

VI. RECOMMENDATIONS

I recommend that the District Ranger and Staff consider this area surveyed for reforestation on the basis of the following research and observations:

1. The total acreage of Browse that would have to be controlled in order to establish a plantation is not large (0.65%) in proportion to the total acres available in the Collins Butte S&G Allotment. $\frac{122 \text{ Acres}}{18{,}650 \text{ Acres}} = 0.65\%$

2. Eradication of Ceanothus would be impracticable however, the Ceanothus could be controlled temporarily by mechanically or aerial spraying with 2,4,5-T @ 1 to 1.5 lbs. per acre to allow establishment of the seedlings.[1] This treatment should not adversely affect the Browse supply for game since

[1] Herbicides and Their Use in Forestry, Oregon State University, September 7-9, 1961

Ceanothus velutinous is not an important game browse species.[1] Care would have to be taken to prevent destruction of the few Bitter Brush (Purshia tridentata) shrubs that also inhabit this area, since they are valuable Browse species.

3. This area is classified according to the Heppner District Multiple Use Plan as a commercial timber site.

4. The timber growing capacity of this area is very good as indicated by the site classification. Sites previously mentioned in this report are averages. Some sites III are found with portions of the area falling into the site IV classification.

5. A reforestation program for this area is feasible from the cost per acre standpoint (see attached cost calculations in the Appendix).

    a) Ceanothus could be aerial sprayed with 2,4,5-T to temporarily defoliate this shrub.

    b) After spraying, Pinus ponderosa seedlings (2-1 stock) could be planted next to the tap root of the Ceanothus shrub with the aid of the "Little Beaver", an auger type tree planting power tool. Planting the trees next to the root in this manner would provide:

        1) Intermittent shade from the leafless twigs of the Ceanothus (very important in this area since extremely high temperatures are experienced on occasion).

        2) Protection from browsing by sheep and deer.

        3) Protecting from trampling by livestock and big game.

        4) (May provide) more available moisture since annual grasses, forbs, and perennial grasses and forbs would severely compete for moisture in the openings between shrubs.

        5) Available nitrogen which is produced in the Nitrogen-fixing root nodules of the Ceanothus shrub and is known to be an aid to Ponderosa pine reproduction. [2]

    c) 2-1 planting stock could be used since most of the soils are deep and aerable.

[1] Range Plant Handbook, U.S. Forest Service, USDA, Page B 48, March, 1937.

[2] Wahlenberg, "Effects of Ceanothus Brush on Western Yellow Pine Plantations in the Northern Rocky Mountains", Journal of Agricultural Research (U.S.) 41: 601-612, illus. 1930.

d) By applying the above methods, fencing, caging, artificially shading, and etc. would not be necessary. Therefore, the costs per acre would include only planting, aerial spraying and protection from pocket gophers and other rodents if found to be necessary after planting.

HEPPNER DISTRICT

Umatilla National Forest

1928 Burn Planting
Cost Estimates

P&M Funds

ALTERNATIVE #1

A. Trial Planting

Plant 400 2-1 Pinus ponderosa seedlings on a trial basis to determine whether planting can be done successfully according to the following method:

a. 1. Treat a strip of Ceanothus velutinous two foot wide with a herbicide to temporarily defoliate the Ceanothus. (2,4,5-T)

2. Plant 200 of the seedlings in the Ceanothus shrubs next to the tap root by means of the "Little Beaver" tree planting auger.

b. 1. Plant 200 of the seedlings in the Ceanothus shrubs next to the tap root on the south side of the shrubs by means of the "Little Beaver" tree planting auger as a control.

LABOR FOR PLANTING

			Per diem
GS-7	32 hours @ $3.726/hour =	$119.00	$20.00
GS-7	32 hours @ $2.750/hour =	88.00	20.00
	Sub Totals	$270.00	$40.00

EQUIPMENT

½ Ton pickup 500 miles @ $0.10/mile =	50.00
Little Beaver operator	5.00
Sub Total	$55.00

MATERIALS AND SUPPLIES

Trees (2-1 Pinus ponderosa) @ $15.00/M. – 450 = $6.75

Herbicides for 1/10 acre (2,4,5-T) 1.5 lbs./acre

Two applications (one lb. in emulsion or water carrier) Reference – Herbicides & Their Use In Forestry, Oregon State University, September 7-9, 1961

1 lb. @ $5.00/lb.	= 5.00
Sub Total	$11.75

MISC. SMALL TOOLS

Hand applicator for herbicides	$15.00
Steel rods for marking treated Ceanothus and planted trees	15.00
Sub Total	$30.00
Total	$343.75

FOLLOW UP EXAMINATION & REPORT

			Per diem
GS-7	16 hours @ $3.726/hour =	$60.00	$10.00
	Sub Totals	$60.00	$10.00

EQUIPMENT

½ Ton pickup 100 miles @$0.10/mile	= $10.00
Sub Total	$10.00
Total	$80.00
Planting Cost	$343.75
Examination	80.00
Grand Total	$423.75

B. ALTERNATIVE II (Priority #1 only)

Plant 82 Acres

Plant 430 Pinus ponderosa 2-1 seedlings per acre with 10' x 10' spacing (82 x 430 = 35,260 trees).

Aerial spray with 1 lb./acre of 2,4,5-T in an emulsion for two years in succession to defoliate the Snowbrush Ceanothus.

a. Aerial spray with 2,4,5-T – First application 1964 F.Y. (July)

Contract 82 acres @ $2.00/acre	= $164.00	
Forest Service supply flagmen @ 3.726/hr. 16 hrs.	= 60.00	
2,4,5-T @ $2.00/lb. For 82 lbs.	= 164.00	
Equipment/ ½ Ton pickup 100 miles @ 0.10/mi.	= 10.00	
Sub Total	$398.00	

b. Plant labor (April) 1964 F.Y.

			Per Diem
GS-7	32 hours @ $3.726/hr.	= $119.00	$20.00
GS-7	112 hours @ 3.538/hr.	= 396.00	70.00
GS-5	112 hours @ 3.025/hr.	= 339.00	70.00
GS-3	112 hours X 15 @ 2.189/hr. =	3,678.00	
	Sub Total	$4,532.00	$160.00

EQUIPMENT USE

1 Ton Crew Carrier for 1,000 miles @ $0.16/mi.	= $160.00	
½ Ton pickup 1,000 miles @ 0.10/mi.	= 100.00	
½ Ton pickup 500 miles @ 0.10/mi.	= 50.00	
Little Beaver operation & maintenance	= 30.00	
Sub Total	$340.00	

MATERIALS AND SUPPLIES

2-1 Pinus ponderosa seedlings 35,260 @ $15.00/M	$528.90	
Sub Total	528.90	

SMALL TOOLS AND MISCELLANEOUS

Meal subsidy 612 meals @ $0.60	$367.00	
Misc. – 2% of total to this point	124.00	

Sub Total		$491.00
c. Follow-up aerial spray (July 1965)		$398.00
d. Pocket gopher control		$336.00
Total Direct Costs		$7,183.90
Cost/acre =		$87.60

C. ALTERNATIVE III (Priority #1 and 2)

Plant 122 Acres

Plant 430 Pinus ponderosa 2-1 seedlings per acre with 10' x 10' spacing (52,460 trees).

Aerial spray with 2,4,5-T @ 1 lb. per acre in an emulsion for two years in succession to defoliate the Snowbrush Ceanothus.

a. Aerial spray with 2,4,5-T – First application 1964 F.Y. (July)

Contract – 122 acres (Figure given by Gar Aviation)

Lexington, Oregon $2.00/acre	$244.00
Forest Service supply flagmen @$3.726/hr. 16 hrs.	60.00
2,4,5-T $2.00/lb. – 122 lbs.	244.00
Equipment/ ½ Ton pickup 100 miles @ $0.10/mile	10.00
Subtotal	$558.00

b. Plant Labor (April) 1964 F.Y.

GS-7	40 hrs. overhead @ $3.726/hr.	$150.00	$25.00
GS-7	40 hrs. overhead @ 3.538/hr.	142.00	25.00
GS-7	160 hrs @ 3.538/hr.	566.00	100.00
GS-5	160 hrs @ 3.025/hr.	484.00	100.00
GS-3	160 hrs. X 15 = 2,400 @ 2.189/hr.	5,254.00	—
	Subtotal	$6,596.00	$250.00

EQUIPMENT USE

1 Ton Crew carrier for	1,500 miles @ $0.16/mi.	$240.00
½ Ton pickup	1,500 miles @ $0.10/mi.	150.00
½ Ton pickup	1,000 miles @ $0.10/mi.	100.00
Little Beaver operation and maintenance		50.00
	Subtotal	$540.00

MATERIALS AND SUPPLIES

2-1 Pinus ponderosa seedlings (52,460 @ $15.00/M)		$786.90
	Subtotal	$786.90

SMALL TOOLS AND MISCELLANEOUS

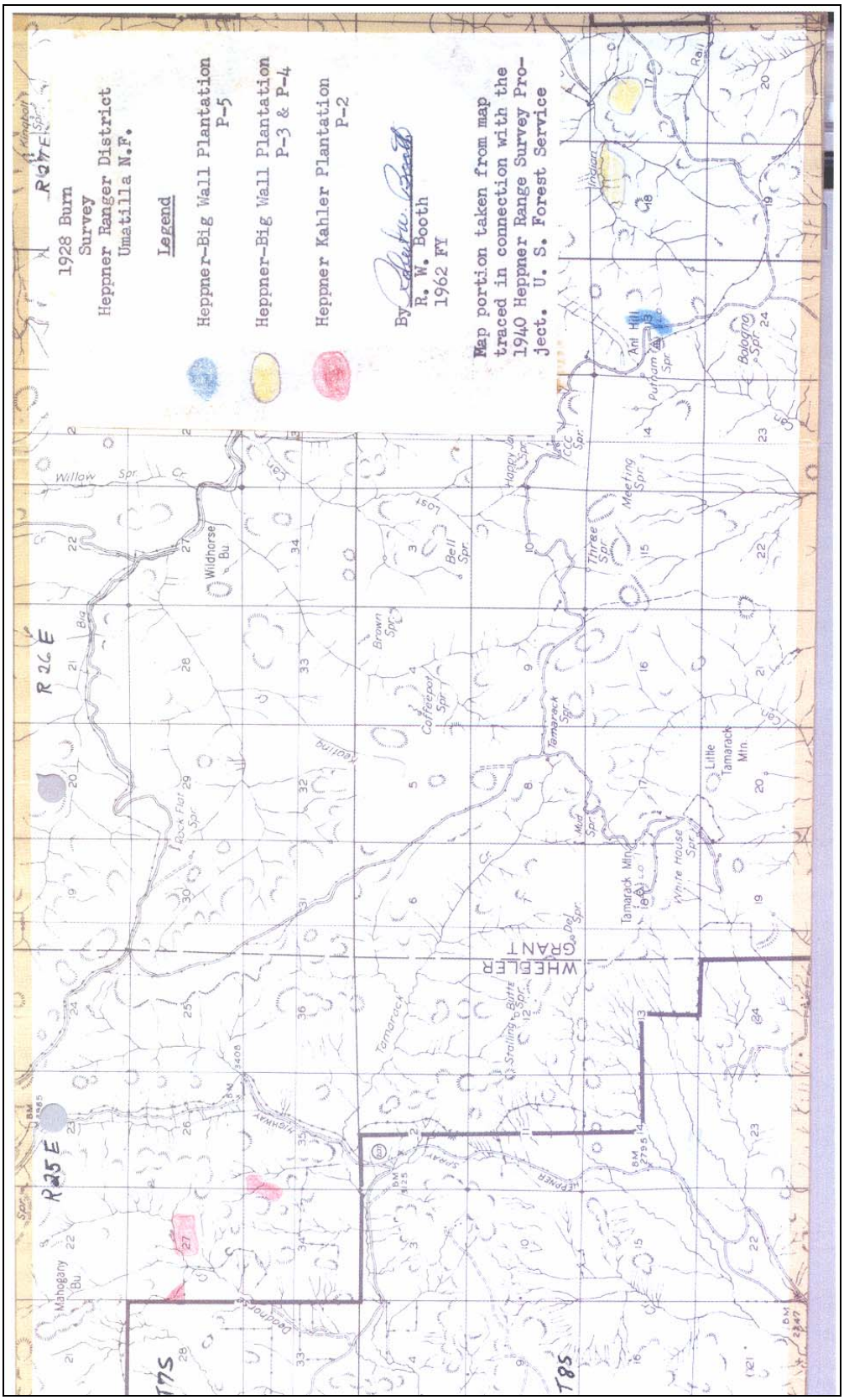
Meal subsidy 816 meals @ $0.60/meal		$490.00
Misc. 2% of total		147.00
	Subtotal	$637.00

c. 1965 Follow-up aerial spray (July) 1965 F.Y. $558.00

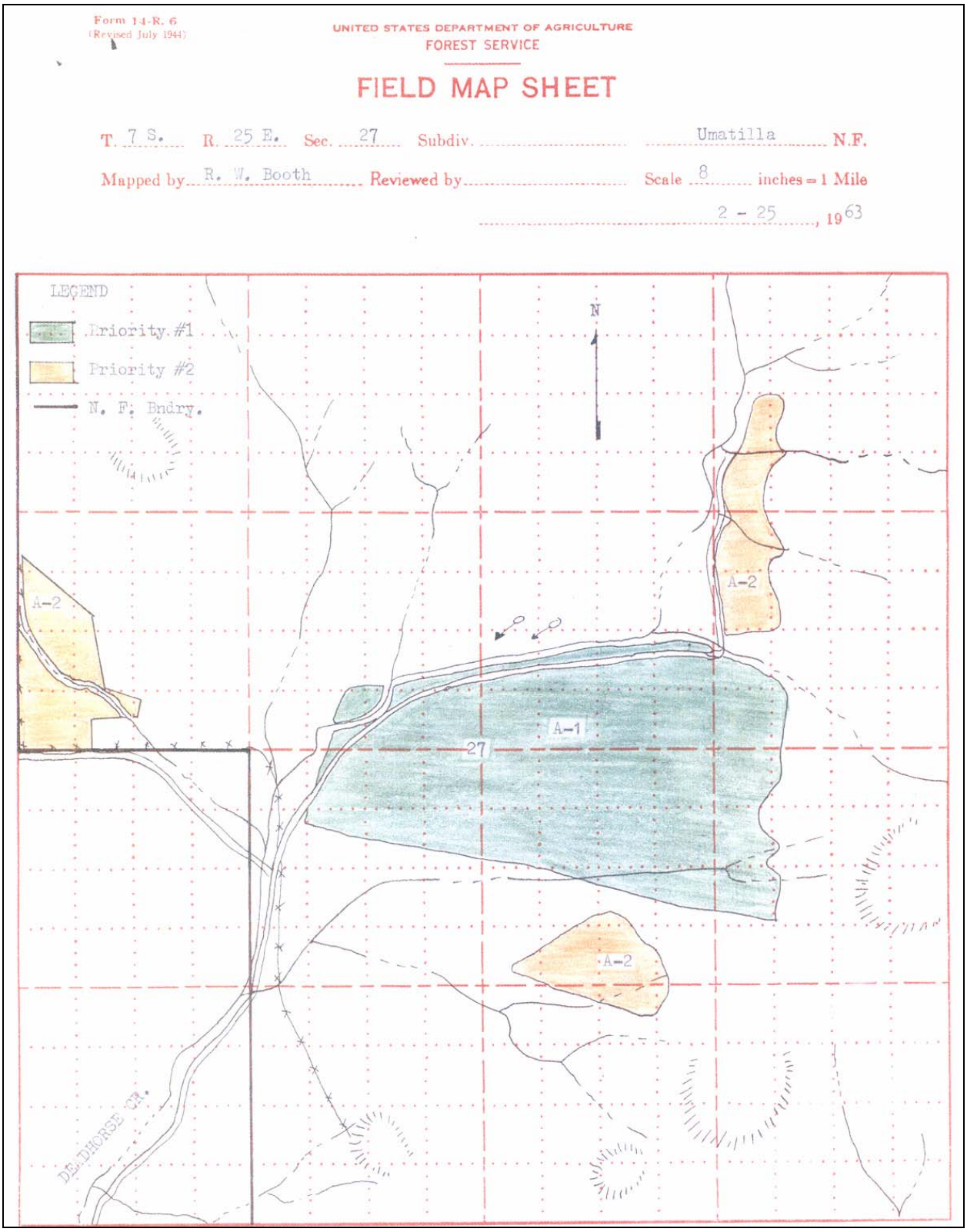
d. Pocket gopher and rodent control $500.00

Total Direct Costs $10,425.90

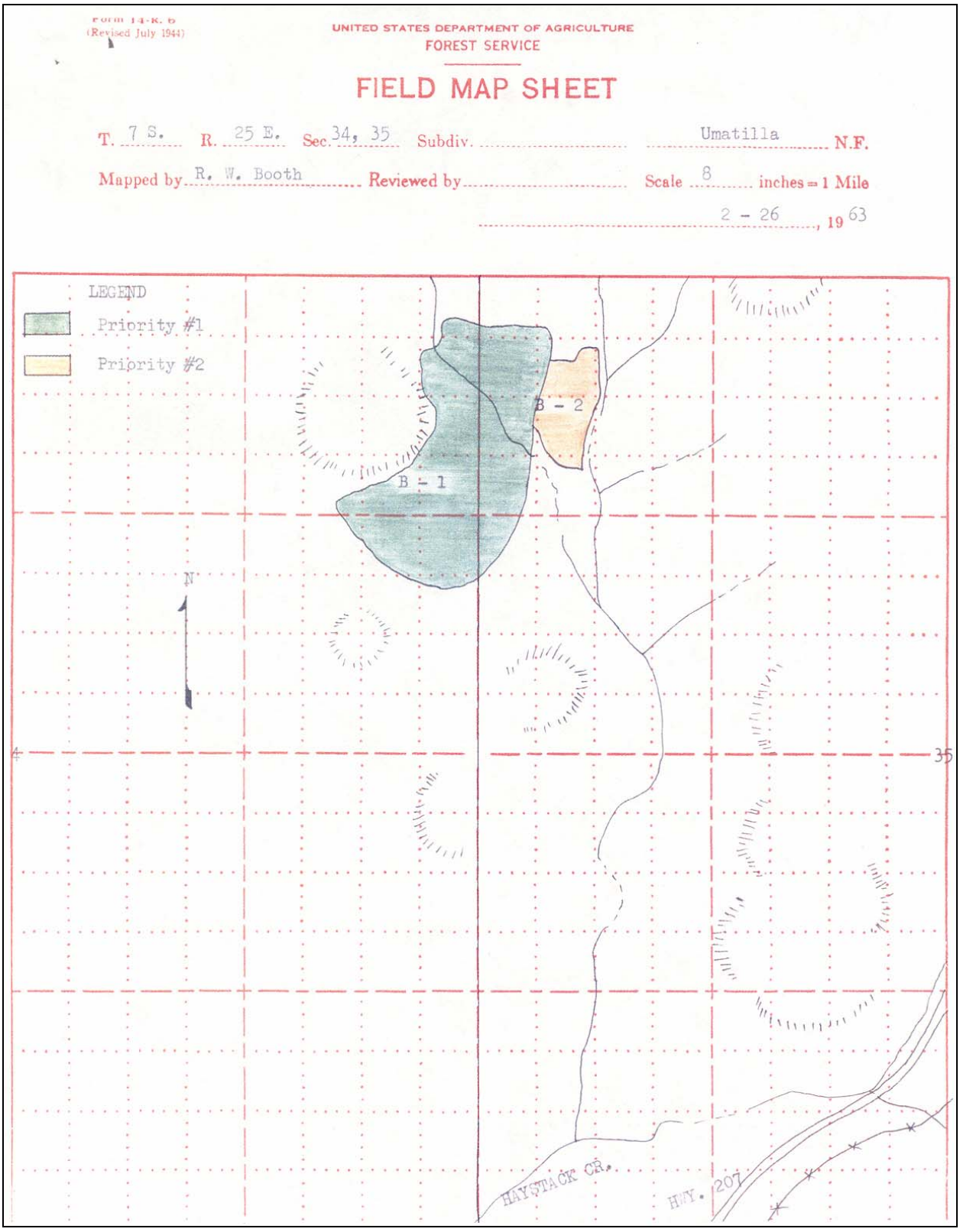
Cost/acre = $85.46



Appendix A: District map.



Appendix B: Field Map Sheets (sheet #1).



Appendix B: Field Map Sheets (sheet #2).

Appendix C: Black and White Photographs

1. General view from west looking toward Unit A-1 on attached map. (Approximately 20 acres in lower portion of area.

2. General view from north looking down on Unit A-2 on attached map. (Approximately 18 acres)

3. Close up of area A-1 from the north, looking south.

4. Large trees indicate the quality of the site.

5. Ceanothus velutinous (Snowbrush Ceanothus) which occupies approximately 35% of the crown cover. (note – little evidence of browsing).

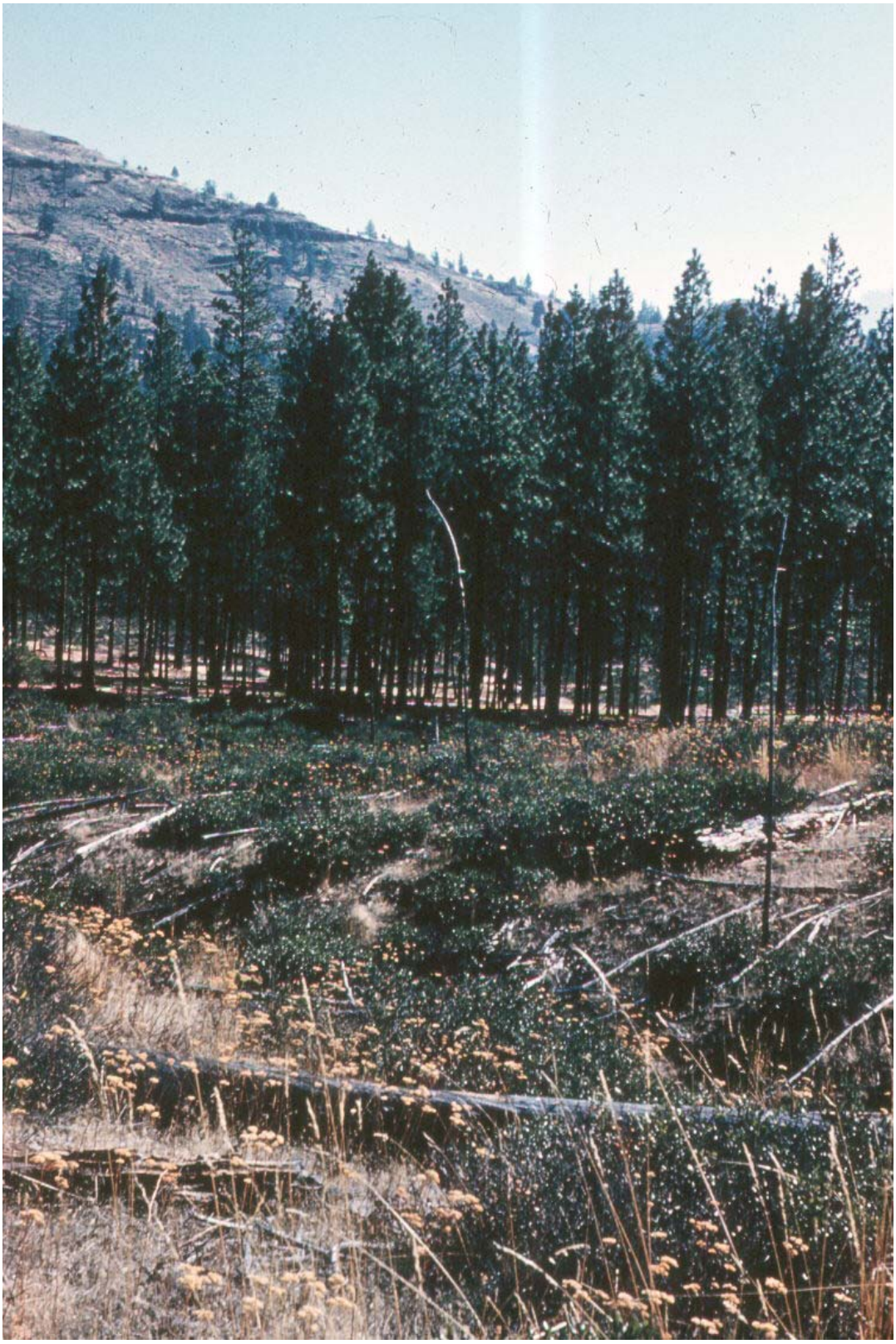
6. Purshia tridentata (Bitter Brush) which is found occasionally in the area. (note browsing)

7. Tolo series soils are deep.

Appendix D: Attached Packet of Colored Slides

Ceanothus velutinous in Area A2

Young Pinus ponderosa seedling growing vigorous lg. Deadhorse canyon



Young stand of Pinus ponderosa adjacent to proposed planting area. Note: site indicat.

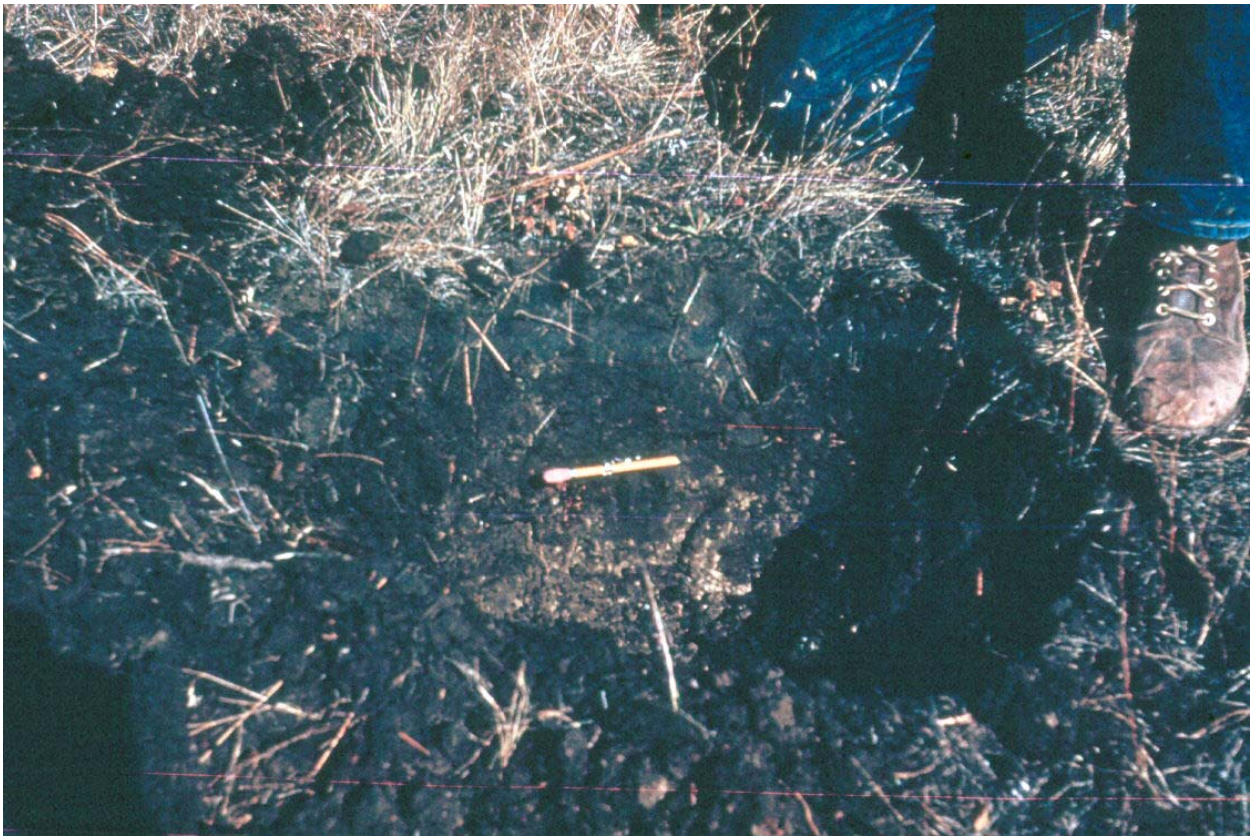
General view of area A-2. Deadhorse Canyon

Tall Pinus ponderosa indicate site potential. Deadhorse Canyon.

Pinus ponderosa growing thru dense overstory of Ceanothus v. Ceanothus is about 3 feet tall.

General view of area A-1 heavily covered by Ceanothus v.

Closeup of Ceanothus velutinous.



Soil horizons in Klicker soil series – pencil marks division between B4C horizon.

Blocky angular soil structure of C horizon in Klicker series soils area A-1.

General view of reprod that survived the fire of 1928.

Pencil marks moisture depth into e horizon of tolo soil series.

Purshia tridentata in area A-2. Note browsing (bitter brush)

General closeup view of area A-1.

Lateral bud nipped by deer.