United States
Department of
Agriculture

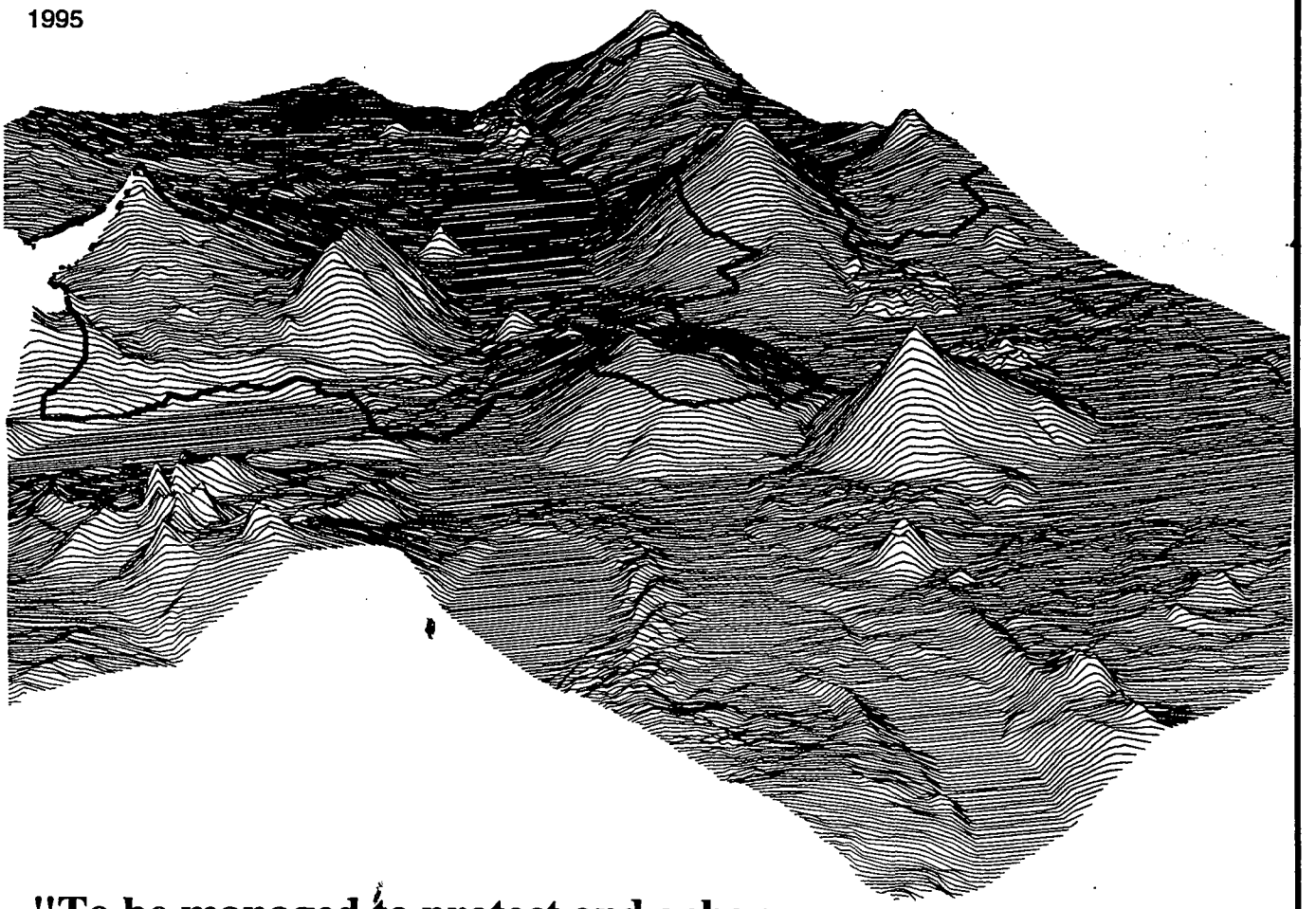
Forest Service

**Pacific
Northwest
Region**

DAVIS LATE-SUCCESSIONAL RESERVE ASSESSMENT

Deschutes National Forest
Crescent Ranger District

1995



"To be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl..."

Northwest Forest Plan, ROD C-11

EXECUTIVE SUMMARY

BACKGROUND - The Davis Late-Successional Reserve (LSR) is 48,890 acres in size and located east of the Oregon Cascade Crest on the Crescent District of the Deschutes National Forest. This area was designated by the 1994 Northwest Forest Plan as part of a network of late-successional and old growth forest ecosystems, which will serve as habitat for late-successional and old growth related species such as the northern spotted owl. As part of the Northwest Forest Plan, management assessments are to be prepared for each designated LSR before habitat manipulation activities are designed and implemented.

In February 1995 the Deschutes National Forest prepared a Forest LSR Overview to set the context for the eleven LSRs located on the Deschutes National Forest. The overview provided general information on forest processes, pattern, structure, and function, as well as, outlined the Forest LSR Assessment Process. For the Davis LSR Assessment, this process was a continuation and expansion of the 1994 Odell Pilot Watershed Analysis which provided the social, physical, and biological context for the area around Davis and Odell Lakes.

KEY QUESTIONS - The LSR Assessment Team focused on two key questions derived from the Northwest Forest Plan's stated objective for LSR management - to protect and enhance late-successional and old growth forest ecosystems and the habitats they provide for old growth related species. The key questions included: 1) How does the Davis Late-Successional Reserve serve as habitat for late-successional and old growth related species including the northern spotted owl? and 2) Where and when are forest management activities needed to protect and enhance the existing and potential habitat for late-successional and old growth related species within the Davis LSR?

MANAGEMENT STRATEGY OVERVIEW - The first question was answered by analyzing existing and historic vegetative conditions within the LSR and determining the historic, present, and potential use of the LSR by late-successional and old growth related species. Following the assimilation of this information, emphasis wildlife species were identified for the areas that logically could be managed to provide a similar habitat type and function. These areas and the percentage of the LSR that they encompass are as follows:

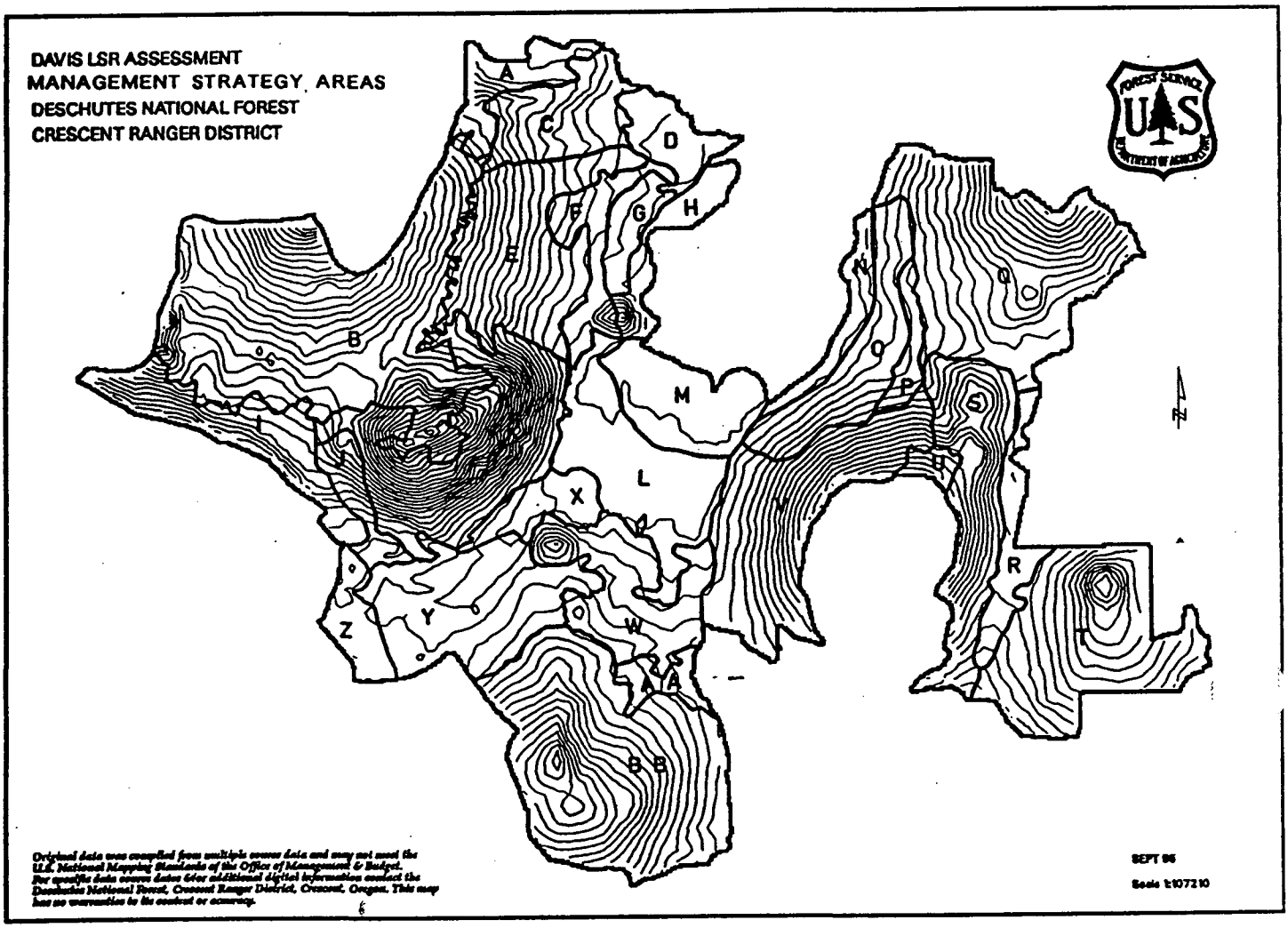
- Mixed conifer for northern spotted owl - 54%
- Mixed conifer for bald eagle - 8%
- Mixed conifer/lodgepole with dual connectivity function - 3%
- Mixed conifer/lodgepole/ponderosa for great gray owl and/or bald eagle - 6%
- Lodgepole with/without riparian for black-backed woodpecker and/or riparian habitat - 16%
- Mountain hemlock for wolverine and black-backed woodpecker - 13%

To answer the second key question, these six areas were assessed according to the following criteria: the existing habitat function within and outside the LSR; the effects of past timber harvesting on the desired habitat function; the risk of catastrophic loss of existing old growth due to fire, insects, and disease; existing human uses within the area; and other factors influencing the attainment of the desired late and old structured ecosystems. The immediate need in the LSR was determined to be reducing the risk of catastrophic loss in a portion of the existing late and old-structured stands that are imminently susceptible to insect attack or wildfire.

MANAGEMENT STRATEGY AREAS - A strategy to maintain a balance between adjusting the existing vegetative conditions within the mixed conifer and lodgepole plant associations groups to a more sustainable balance in the short and long-term and maintaining suitable habitat for old growth dependent species that utilize high risk stands was developed. The appropriate locations, scales, and scheduling of management activities have been recommended by the LSR team based on the existing and desired conditions for the LSR. The six areas described above have been subdivided into 28 Management Strategy Areas (MSAs) to reflect the diversity of existing and potential vegetative conditions. Appropriate management options are recommended for each MSA. These recommendations are not standards and guidelines, but an interpretation of the intent of the Northwest Forest Plan. Site-specific analysis will be required before the implementation of recommendations made in this assessment.

This Late-Successional Reserve is designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem.

Northwest Forest Plan, ROD C-11



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CHAPTER 1

BACKGROUND INFORMATION

Deschutes National Forest
Late Successional Reserves

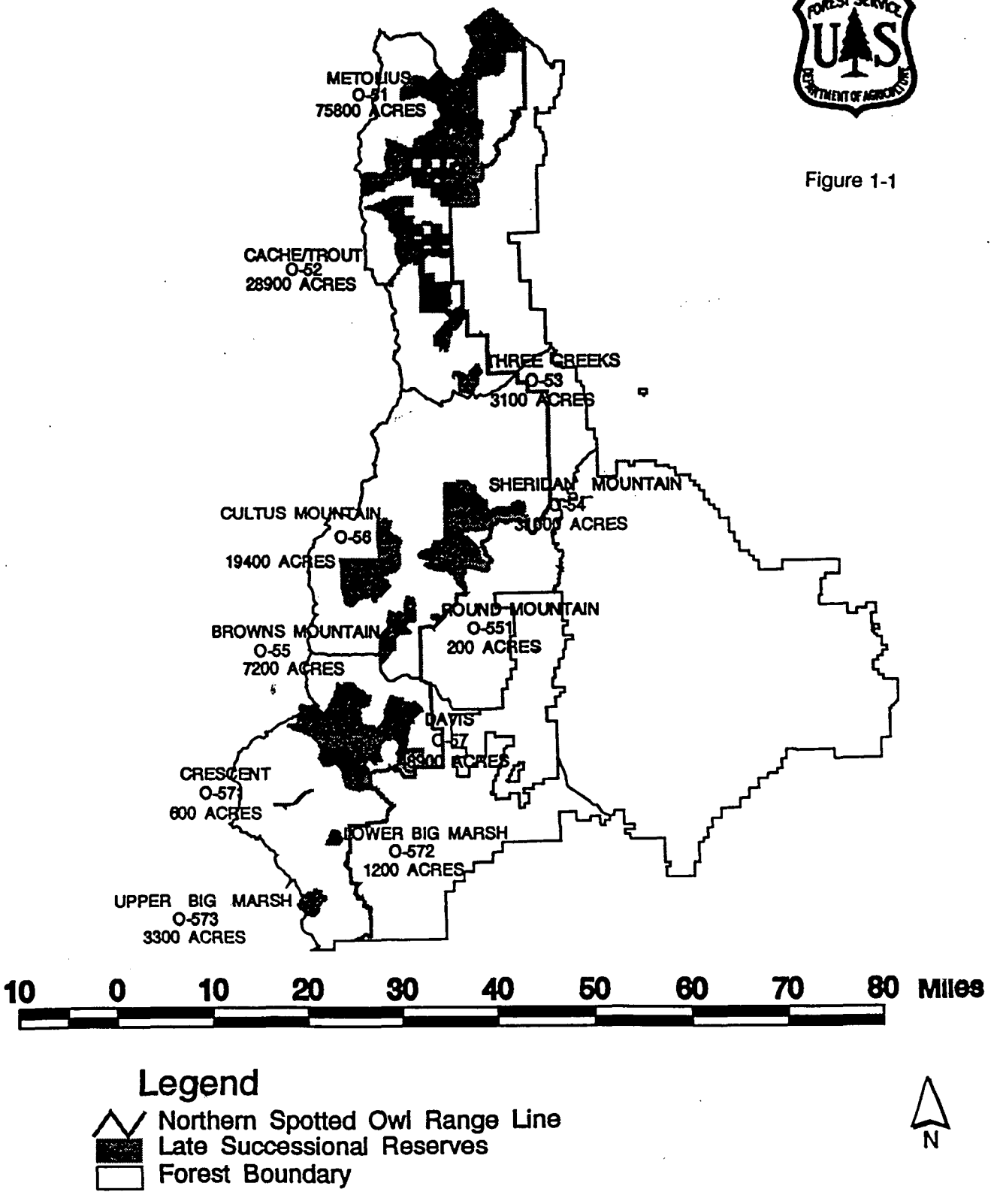


Figure 1-1

WHAT IS A LATE-SUCCESSIONAL RESERVE ASSESSMENT?

The 1994 Northwest Forest Plan allocated areas within National Forests of the Pacific Northwest to be managed as part of an interacting network of late-successional and old-growth forest ecosystems, which will serve as habitat for late-successional and old-growth related species such as the northern spotted owl. As directed by the Northwest Forest Plan, management assessments are to be prepared for each designated LSR before habitat manipulation activities are designed and implemented. These assessments should generally include the following eight elements:

1) A history and inventory of overall vegetative conditions within the reserve;

2) A list of identified late-successional associated species known to exist within the Late-Successional Reserve and information on their locations;

3) A history and description of current land uses within the reserve;

4) A fire management plan;

5) Criteria for developing appropriate treatments;

6) Identification of specific areas that could be treated under those criteria;

7) A proposed implementation schedule tiered to higher order plans; and

8) Proposed monitoring and evaluation components to help evaluate if future activities are carriec out as intended and achieve desired results.

(Northwest Forest Plan, Record of Decision, C-11)

To some extent, the eight elements listed above have all been addressed in one or more of the following documents: the 1994 Northwest Forest Plan, the 1994 Odell Pilot Watershed Analysis, the 1995 Deschutes National Forest Late-Successional Reserve Overview, the 1990 Deschutes National Forest Land and Resource Management Plan (LRMP), and this document - the Davis Late-Successional Reserve Assessment. The following is a brief summary of each of these documents as they pertain to the eight elements.

1994 NORTHWEST FOREST PLAN

The 1994 Northwest Forest Plan provides the objectives for this LSR assessment. The following objective was used to develop the team's key questions and focus the assessment:

> "Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem." (C-11)

Other objectives include:

> "...provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid foreclosure of further management options...provide habitat for populations of species that are associated with late-successional forest...and help ensure that late-successional species diversity will be conserved." (B-4,5)

As stated above, "protect and enhance conditions of late-successional and old growth forest ecosystems" is the main objective for this LSR Assessment. The Northwest Forest Plan allows management strategies and activities to be developed that "protect and enhance" conditions which inherently exist on the east or west sides of the Cascade Mountains.

The Northwest Forest Plan recognizes that LSRs east of the Cascades have an increased risk of fire due to lower moisture conditions and the large accumulations of fuels following insect outbreaks and drought, therefore, the Northwest Forest Plan allows additional protection oriented activities to occur in these LSRs.

The ROD Standards and Guidelines state that risk management activities may reduce the probability of major stand-replacing events and are encouraged. Specific guidelines for salvage and multiple-use activities other than silviculture are provided in the Northwest Forest Plan. (C-11 through C-21)

DESCHUTES NATIONAL FOREST LSR OVERVIEW

In February 1995, the entire network of Late-Successional Reserves designated on the Deschutes National Forest was assessed to provide a larger context for each of the site-specific LSR assessments. (See Figure 1-1). A Forest-wide overview document was prepared to provide LSR teams with the following information: 1) a general description of the vegetative series and related floral and fauna species for each specific LSR; 2) a discussion of the processes that sculpted the Forest landscape and potential future risks; 3) a description of forest pattern and structure; and 4) a discussion of forest function across the landscape with regard to habitat and habitat connectivity.

The Forest Overview recognizes that some of the Deschutes LSRs provide habitat for species which rely on late structured stands maintained by frequent, low intensity fire regimes. Much of the Davis LSR is occupied by this dry, mixed conifer forest that is characterized as a "fire-climax" ecosystem. Currently, most of these forest stands are overstocked and at high risk for insect and disease infestation and catastrophic wildfire.

The LSR also contains wet and dry, mixed conifer forests which can be managed as "climatic-climax" ecosystems. These ecosystems are better suited for providing habitat for some species dependent on late and old structured stands, including the northern spotted owl.

The Forest Overview acknowledges the need to maintain a dynamic balance of all vegetative series including both the climatic-climax and fire-climax ecosystems to provide opportunities for ecosystem maintenance and restoration of existing and potential natural vegetation.

The Forest Overview also notes that the mountain pine beetle epidemic has affected many of the late and old-structured lodgepole stands that bisect the Davis LSR and serve as dispersal habitat for the northern spotted owl.

Davis LSR is surrounded by the following land allocations on the Crescent Ranger District: Administratively Withdrawn Areas - 69,483 acres; Congressionally Reserved Areas - 40,458 acres; Matrix areas - 62,770 acres; and other LSRs - 5,035 acres (Crescent LSR, Upper Big Marsh LSR, Lower Big Marsh LSR).

A large contiguous block of Administratively Withdrawn lands (LRMP designation - Dispersed Recreation) flanks the Davis LSR to the northwest. The Diamond Peak Wilderness located west of Davis LSR and the Oregon Cascades Recreation Area located to the southwest constitute the majority of Congressionally Reserved Areas on the district and provide connectivity of late and old-structured (LOS) forests between the Davis LSR, Crescent LSR and LSRs west of the crest of the Cascades.

The majority of the land north of Davis LSR on the Crescent and Bend Ranger Districts is Matrix land. These Matrix lands are highly fragmented and habitat connectivity to the Cultus and Brown's LSRs is marginal. Matrix and private land dominate the landscape south of Davis LSR. Habitat fragmentation between the Davis and Lower Big Marsh LSRs is also a concern.

Approximately 6,000 acres of Matrix land (west of the spotted owl range line) flank Davis LSR to the east. This area provides additional nesting, roosting, and foraging (NRF) habitat for spotted owls but is also fragmented. The northeast boundary of the Davis LSR is bordered by Matrix land on Davis Mountain which provides dispersal habitat and limited NRF habitat connectivity with the Brown's LSR located about three miles to the north.

CRITICAL HABITAT UNIT DESIGNATIONS

The Davis Late-Successional Reserve is encompassed by a designated Critical Habitat Unit (CHU OR-7). Only minor portions of this CHU fall outside of the Davis LSR boundaries. This inconsistency is more by oversight than intent. This CHU land designation by the US Fish and Wildlife Service (USFWS) provides protection of habitat under the Endangered Species Act. Consultation with the USFWS is required before activities can occur in the CHU.

DESCHUTES NATIONAL FOREST PLAN

The 1990 Deschutes National Forest Land and Resource Management Plan (DNF LRMP) allocated several areas within the Davis LSR to be managed to provide specific wildlife habitats. Three Bald Eagle Management Areas (BEMAs) are designated within the LSR near Davis and Odell Lakes. (See Figure 2-6) Four Old Growth Management Areas are also designated within the LSR. (See Figure 2-20) Two Key Elk Areas are designated within the lodgepole pine plant association group. (See Figure 2-7)

1994 ODELL PILOT WATERSHED ANALYSIS

The Davis LSR Assessment is considered to be a continuation of the 1994 Odell Pilot Watershed Analysis which set the overall physical, social, and biological context for the Davis LSR. Only a small portion of the LSR is not included in the Odell Watershed. (See Figure 1-2)

A great deal of knowledge about wildlife species in the Davis LSR has already been documented in the 1994 Odell Pilot Watershed Analysis (Odell WA). Appendix E, Tables 3-8 of the Odell WA contains lists of the species found in the Plant Association Groups (PAGs) and the structural stages that they utilize for breeding, foraging and/or resting habitat.

The LSR team attempted to minimize repetition of information already documented in the Odell WA and its appendices. Therefore, this assessment primarily incorporates information from the watershed analysis by reference.

DAVIS LATE-SUCCESSIONAL RESERVE ASSESSMENT

This assessment is a site-specific LSR Assessment for the Davis Late-Successional Reserve which encompasses 48,890 acres near Davis Lake. This document accounts for each of the eight elements listed in the Northwest Forest Plan (C-11) for LSR Assessments. Pertinent information from the documents

described above plus additional new information has been organized into a strategy designed to attain the objectives developed for LSRs in the Northwest Forest Plan.

The following is an index for the eight elements to be included in a Late-Successional Reserve Assessment. The location of pertinent information addressing each element is identified.

1) A history and inventory of overall vegetative condition;

- -- Odell Pilot Watershed Analysis - Historic Range of Variability and Plant Association Group discussions
- -- Deschutes LSR Overview - Forest overview of vegetative conditions
- -- Chapter 4, Management Strategy Areas - Existing Condition, Fragmentation, Late and Old Structured Stands, Forest Dynamics
- -- Chapter 3, LOS Protection Strategies
- -- Chapter 2, Plant Association Group Descriptions

2) A list of identified late-successional associated species;

- -- Deschutes LSR Overview - Forest context of habitats
- -- Odell Pilot Watershed Analysis - Biological Domain
- -- Chapter 4, Management Strategy Areas - Existing Condition, Wildlife
- -- Chapter 3, Areas with a Common Habitat Type and Function Description
- -- Chapter 2, Components of the Wildlife Composite Map with Documentation

3) A history and description of current land uses within the reserve;

- -- Odell Pilot Watershed Analysis - Social Domain
- -- Chapter 4, Management Strategy Areas - Existing Condition, Social Context, Summary Table

4) A fire management plan;

- -- Chapter 4, Management Strategy Areas - Existing Condition, Fire; Management Options, Fire Suppression
- -- Chapter 2, Fire Component - Fire History, Hazard, and Risk
- -- Objectives and Guidelines for Implementing Fire Management Activities in the Davis LSR (Fire Management Plan Document only)
- -- A Fire Management Plan Document was created for the convenient use by fire personnel

5) Criteria for developing appropriate treatments;

- -- Northwest Forest Plan, Record of Decision
- -- Chapter 4, Management Strategy Areas - Emphasis and Selected Species; Criteria for Developing Appropriate Treatments - Objective, Desired Condition, and Management Options
- -- Chapter 3, Management Strategy Overview
- -- Odell Pilot Watershed Analysis - Goals, objectives, and opportunities
- -- Deschutes Forest Plan - Standards and guidelines, Bald Eagle Management Plans, etc.

6) Identification of specific areas that could be treated under those criteria;

- -- Chapter 4, Management Strategy Areas - Objective and Management Options
- -- Chapter 3, Management Strategy Overview, LOS Protection Strategies, and LOS Enhancement Strategies

-- Chapter 2, How Management Strategy Areas were delineated

7) A proposed implementation schedule tiered to high order (i.e. larger scale) plans;

-- Chapter 4, Management Strategy Areas - Objective and Management Options
-- Chapter 3, LOS Protection Strategies and LOS Enhancement Strategies

8) Proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results.

-- Chapter 4, Management Strategy Areas - Monitoring of Management Options; Monitoring, Evaluation, and Research
-- Chapter 3, Monitoring Priorities
-- Odell Pilot Watershed Analysis

PUBLIC AND INTERAGENCY PARTICIPATION

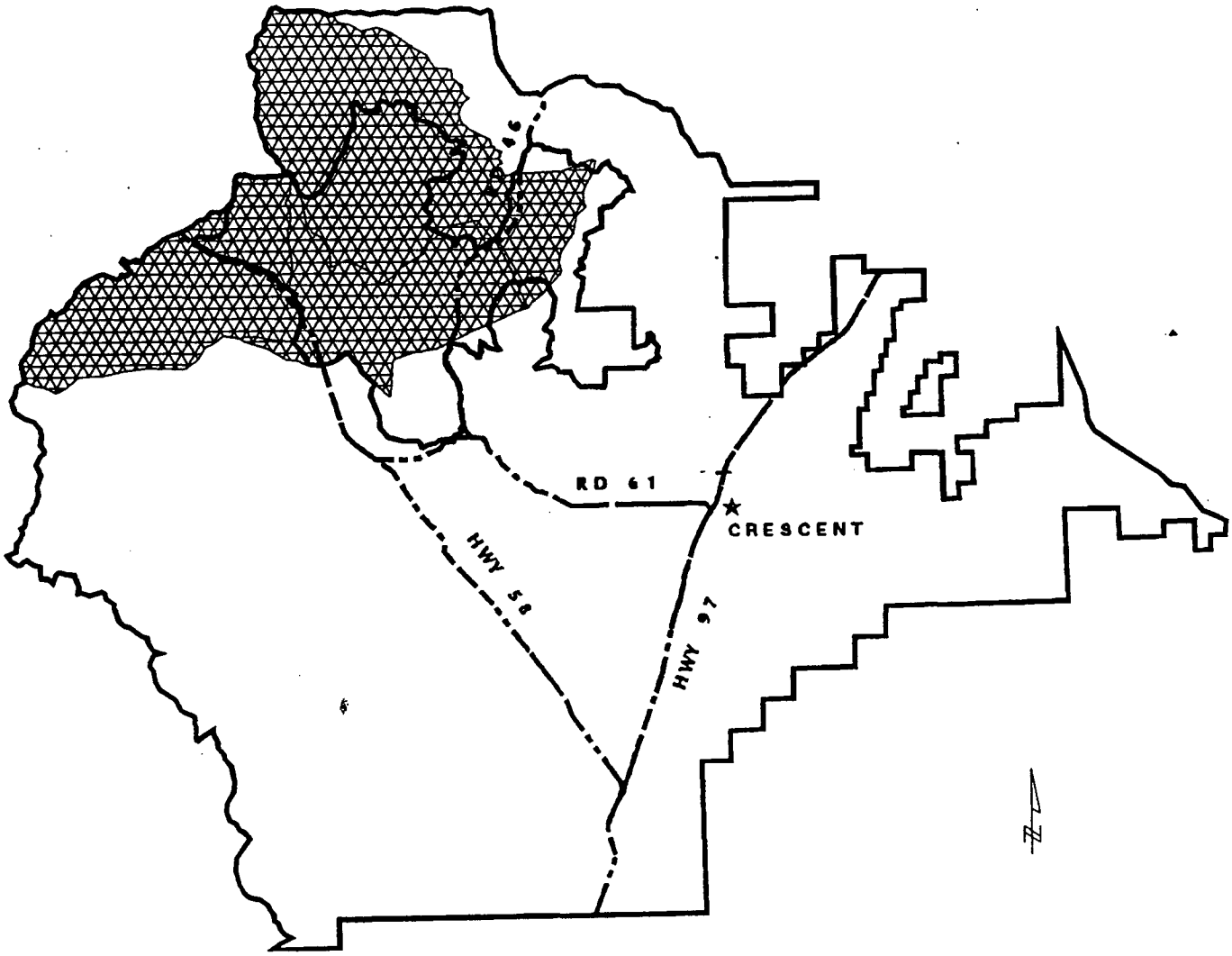
In March 1995, a public open house was held in Bend, Oregon to share information about Late-Successional Reserves and the assessment process. Some issues and concerns were identified for the Davis LSR. However, the majority of public issues concerning the Davis LSR were identified during the 1994 Odell Pilot Watershed Analysis.

Interagency participation during the Odell Pilot Watershed Analysis also benefited the Davis LSR Assessment. A representative from the US Fish and Wildlife Service was a member of the watershed analysis core team. Her participation on the team helped provide the ground work needed for this LSR Assessment. During the LSR Assessment process, two representatives from the US Fish and Wildlife Service helped review our assessment process and consequent management options.

In December 1995, these two representatives and members of the interagency Issue Resolution Team (IRT) and the Regional Ecosystem Office's (REO) Late-Successional Reserve Working Group visited the Davis LSR to review and provide input to the draft assessment.

Figure 1-2

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT



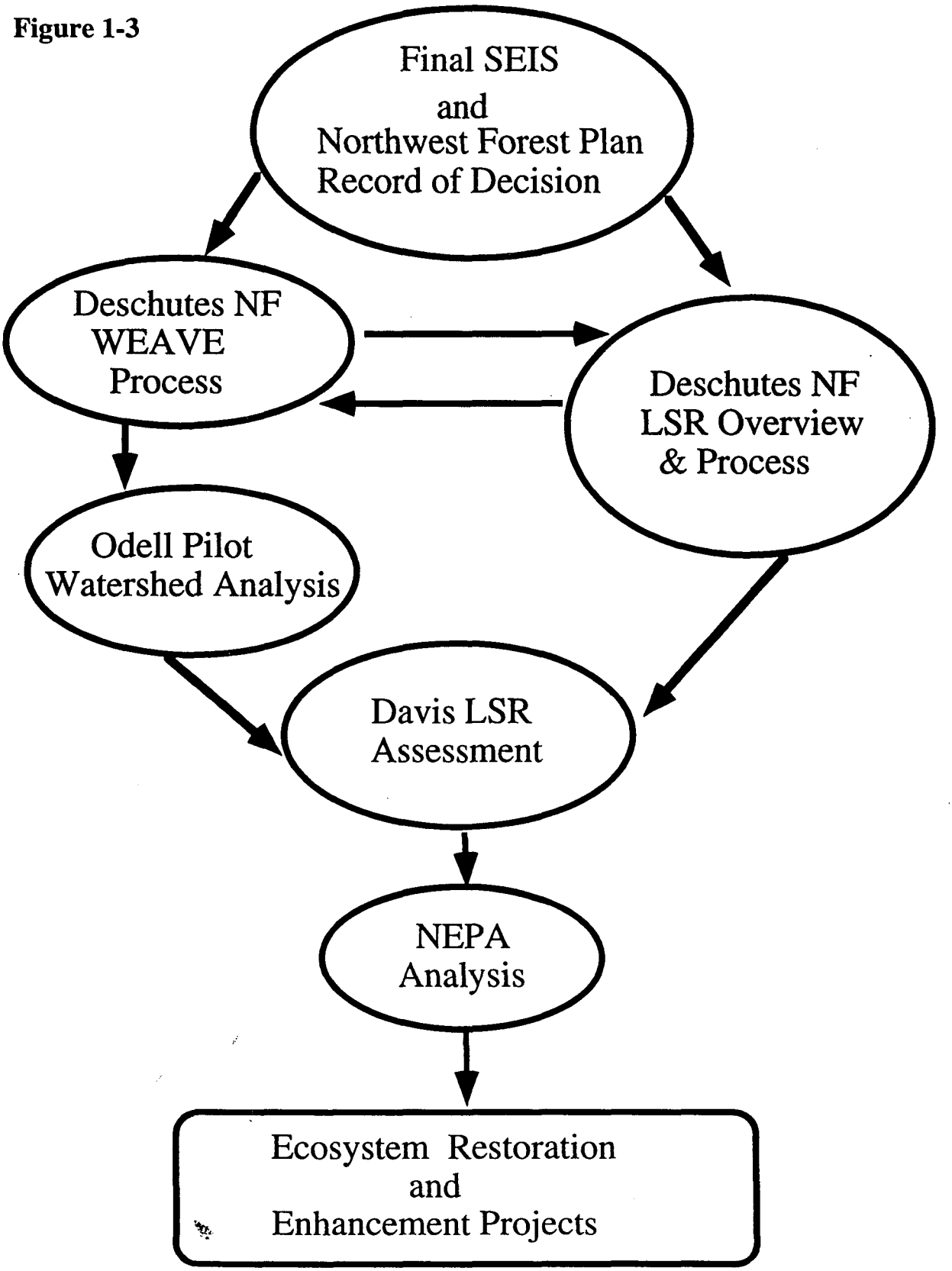
DAVIS LSR ASSESSMENT

ODELL PILOT WATERSHED

Crescent RD/BH
SEPT-95

From here to there....the road to the Davis LSR

Figure 1-3



CHAPTER 2

ANSWERING THE KEY QUESTIONS

LSR OBJECTIVE

"Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem." (Northwest Forest Plan C-11).

KEY QUESTIONS TO ANSWER

In response to the objectives set for LSRs in the Northwest Forest Plan (C-11), the Davis LSR Assessment Team developed two key questions to guide and streamline their data gathering and analysis process. The two key questions were stated as follows:

> **FIRST - How does the Davis Late-Successional Reserve serve as habitat for late-successional and old growth related species including the northern spotted owl?**
>
> **SECOND - Where and when are forest management activities needed to protect and enhance the existing and potential habitat for late-successional and old growth related species within the Davis LSR?**

The first question was developed to understand the different types of late-successional and old growth habitat that exist, or have the potential to exist, within the Davis LSR. By answering this question the LSR was stratified into six areas with each area representing a different type of wildlife habitat and function. These areas were mapped and their functions within and outside the Davis LSR were documented. (See Figures 2-1 and 2-11).

The second question was then developed to understand the existing condition of these delineated habitat areas and determine "when" and "where" management activities should be recommended to protect and enhance their late and old-structured components. The scope of potential management activities was confined to the issues and opportunities identified in the Northwest Forest Plan, the Deschutes National Forest LSR Overview, and the 1994 Odell Pilot Watershed Analysis. Consequently, the following activities were considered:

- Development/Maintenance/Enhancement of habitat for late-successional and old growth related species (including wildlife, plants, fungi, etc.)
- Wildfire suppression
- Reduction of the risk of catastrophic fire disturbances
- Reduction of the risk of catastrophic insect and disease disturbances
- Utilization of fire, insect, and disease disturbances to meet habitat needs
- Restriction/Improvement/Reduction/Maintenance of road access
- Monitoring/Evaluation of management activities
- Protection/Enhancement of threatened and endangered species habitats
- Attainment of LSR-related objectives and opportunities in the Odell Watershed Analysis
- Management of noxious weeds
- Restoration/Maintenance of soil quality within the LSR

- Management of commodities within the LSR
- Management of recreational use within LSR
- Identification of resource inventory needs

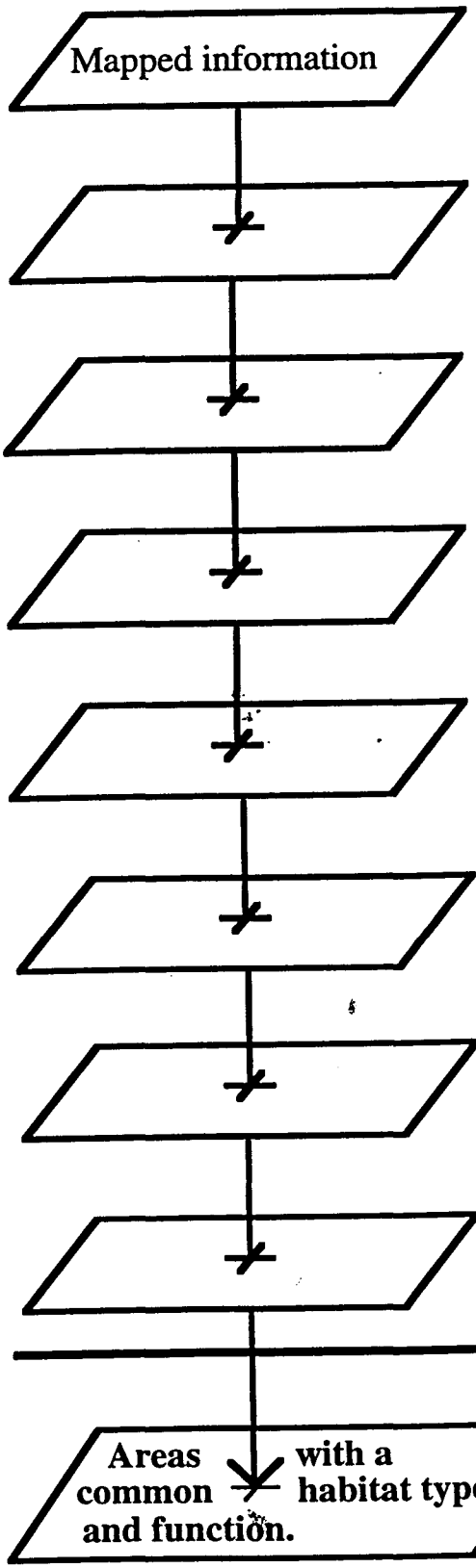
From this analysis, a wide range of conditions was determined to exist throughout the identified habitat areas. For example, some areas that provide or have the potential to provide habitat for the northern spotted owl were assessed as being in imminent risk of losing their late and old-structured components from insects, disease, or fire. While other areas providing the same type of habitat were assessed as being healthy with a need for minimal maintenance activities.

To represent this diversity of existing conditions, the six large areas (Figure 2-11) representing the different types of wildlife habitat and/or function within the LSR were subdivided into smaller areas. The team refers to these areas as Management Strategy Areas (MSAs) because their existing conditions seem unique enough to logically suggest a different management strategy in terms of activities or timeline.

The overall management strategy overview for the six large areas is discussed in Chapter 3. In addition, the desired late successional conditions for the LSR as a whole and specifically for the plant association groups and emphasis species are displayed. Recommendations for managing the dead wood component and LOS protection and enhancement strategies are also documented in Chapter 3.

The findings and recommendations of this assessment are documented and organized by the Management Strategy Areas (Chapter 4). There are twenty-eight MSAs delineated within this 48,890 acre LSR. For each MSA, an existing condition, desired condition, objective, management options, and monitoring and evaluation elements have been identified and documented. Although this format has created a larger document than originally anticipated, it is hoped that a balance between watershed and National Environmental Policy Act (NEPA) analysis has been achieved.

How does the Davis Late-Successional Reserve (LSR) serve as habitat for late-successional and old growth related species including the northern spotted owl?



Known northern spotted owl activity centers - nest sites and home range radius.

Existing and potential northern spotted owl nesting, roosting, and foraging habitat.

Plant Association Groups - historic, existing, and potential vegetation.

Existing and potential habitat for black-backed and white headed woodpeckers, great gray and flammulated owls, goshawks, and forest carnivores.

Wildlife Management Areas allocated in the Deschutes National Forest Plan for bald eagle and elk.

Wildlife travelways and dispersal corridors for selected species - northern spotted owl, amphibians and forest carnivores.

Wildlife observation sites.

Riparian areas and their associated habitat.

A composite map illustrating areas within the Davis LSR that share a common dominant habitat type and function for late-successional and old growth related species.

Figure 2-1

How does the Davis LSR serve as habitat for late-successional and old growth related species including the northern spotted owl?

Because the end product of the LSR Assessment should be a strategy that protects and enhances habitat for all late successional and old growth species known or suspected to occur in the Davis LSR, it is necessary to make conscious decisions about where to manage for which species and over what time period. A balance between species needs must be achieved and sustained over time.

Equally important are the interactions of these species and their culmination in a functioning forest ecosystem. Although it was not possible to visually illustrate the concept of "the whole is more than a sum of its parts" in this process, ecosystem function as well as emphasis species needs were considered to be key components in delineating the different habitat areas within the Davis LSR.

The following species or species groups and their associated habitats were selected to provide a means of focusing and prioritizing areas within the LSR for protection and enhancement activities: northern spotted owl, pileated woodpecker, northern goshawk, black-backed woodpecker, great gray owl, flammulated owl, white-headed woodpecker, northern bald eagle, osprey, wolverine, marten, fisher, elk, amphibians, and neotropical migratory birds. These emphasis species were selected because they utilize and represent a broad spectrum of habitat types in the various plant association groups (PAGs).

For example, the black-backed woodpecker primarily utilizes late and old growth stands in the lodgepole pine PAG, and the spotted owl utilizes late and old growth stands in the mixed conifer PAGs. Moreover, various species may prefer different structural conditions within the same plant association group. In the mixed conifer dry PAG, the white-headed woodpecker utilizes forest stands with a more open structure, while spotted owls utilize stands with a more dense, multi-storied structure. It is assumed that by protecting and enhancing late successional ecosystems and attempting to accommodate the diverse habitat needs of these emphasis species, other late successional species will also be protected.

Figure 2-1 illustrates the thought process that was used to determine and delineate areas within the LSR that share a common dominant habitat type and/or function. A prototype composite map, which is not included as part of this document, was first created by overlaying all of the habitat maps illustrated in Figure 2-1. Different habitat areas were delineated based on the current condition of habitat for these species and biological judgement. For example, if an area presently functions as a spotted owl activity center, it was delineated to serve as "climatic-climax" type habitat versus "fire-climax."

From this prototype wildlife habitat composite map, which was a cluttered and complex assimilation of all of the key species habitats, a revised map, entitled "Areas with a Common Dominant Habitat Type or Function" was derived (see Figure 2-11). This map illustrates common habitat function and connectivity within the various plant association groups.

For example, one area identifies where it is desirable to maintain a functional late and old structured (LOS) ecosystem in the mixed conifer PAG. This area would provide nesting, roosting, foraging (NRF) habitat for the spotted owl and the myriad of other plant and wildlife species that are associated with this type of ecosystem. Another area on the map illustrates an area of lodgepole pine PAGs where it is desirable to provide habitat for black-backed woodpeckers and a multitude of riparian associated species. The "Dual Connectivity Areas" provide important habitat links and functions in both the lodgepole and the mixed conifer PAGs.

This map illustrates the first step toward delineating the Management Strategy Areas (MSAs) within the LSR. The map of the areas with a common dominant habitat type or function was the foundation, or base

map for determining the MSAs. The subdivision of these areas into the MSAs is described in the next section which answers the second key question.

The following is a general description of each component that contributed to the identification of the areas with a common dominant habitat type or function within the LSR. Detailed descriptions of habitat needs and their existing conditions can be found in Chapter 2, Biological Domain-Wildlife Section and Appendix E of the Odell Pilot Watershed Analysis (Odell WA) and in Chapter 4 of this assessment.

NORTHERN SPOTTED OWL COMPONENT

The Davis LSR is located at the eastern edge of the range for the northern spotted owl. Protection of the owl in this fringe habitat is believed to be important for the viability of the species. Individuals and populations at the edge of a species range often possess the genetic constitution that expands the adaptive capability of the species. This capability affords the species protection from random catastrophic events and enhances its ability to adapt to large-scale changes such as global warming.

The Davis LSR is located in a designated Critical Habitat Unit for the northern spotted owl. This land designation by the United States Fish and Wildlife Service (USFWS) provides protection of habitat under the Endangered Species Act and requires consultation on management activities that may affect habitat in the CHU.

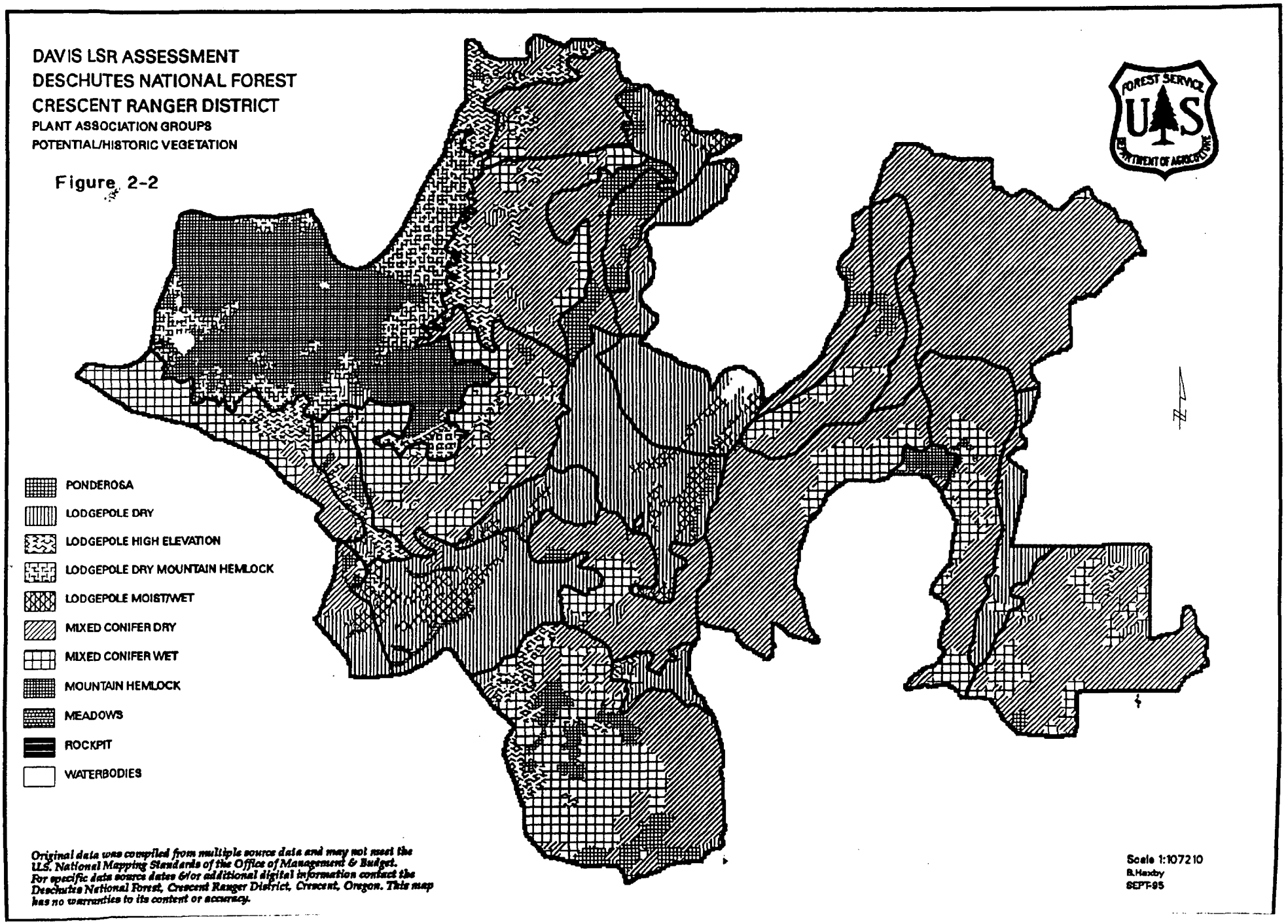
There are eight known spotted owl activity centers in the LSR. Information on these owls including their reproductive history has been collected since 1989. Seven of the eight owl pairs were located during the 1995 monitoring effort. Within the LSR there are 15,451 acres of spotted owl nesting, roosting, and foraging habitat (NRF). Currently NRF habitat occurs on 31.6% of the LSR. (See Figures 2-3 and 2-4)

Based on the assumption that mixed conifer wet and dry Plant Association Groups can be managed to create and sustain NRF habitat, there are 28,857 acres of potential NRF habitat in LSR which equates to approximately 51% of the landbase. It must be recognized that NRF habitat is generally not considered sustainable long-term in the mixed conifer dry PAG without management intervention. Currently, the structure within the mixed conifer dry PAG that the owls are using has developed as a result of fire suppression and the consequent encroachment of white fir in the understory. This habitat type is unstable. Within the LSR the majority of the existing NRF habitat is located in this PAG. (See Odell WA and Chapter 4 of this document for additional PAG information.)

The mixed conifer wet PAG most likely provided the majority of NRF habitat historically. It is believed that NRF habitat in the mixed conifer wet PAG is more sustainable long-term. This PAG occupies 7,715 acres or 16% of the LSR.

Approximately 13,612 acres of harvest (28% of the LSR) that resulted in stands returning to an early successional condition have occurred in the past two to three decades. Additional harvest activities such as scattered salvage treatments have also occurred. The majority of the harvest occurred in stands that provided NRF habitat for the owl. These stands will not provide late successional and old forest conditions for a minimum of 80-100 years.

The following table documents the amount of existing NRF habitat within a 0.7 mile and 1.2 mile radius (home range radius of a spotted owl) around each owl activity center. This information quantifies habitat fragmentation and helps determine high risk areas.


DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
PLANT ASSOCIATION GROUPS
POTENTIAL/HISTORIC VEGETATION
Figure 2-2
FOREST SERVICE
U.S.
DEPARTMENT OF AGRICULTURE
PONDEROSA
LODGEPOLE DRY
LODGEPOLE HIGH ELEVATION
LODGEPOLE DRY MOUNTAIN HEMLOCK
LODGEPOLE MOIST/WET
MIXED CONIFER DRY
MIXED CONIFER WET
MOUNTAIN HEMLOCK
MEADOWS
ROCKPIT
WATERBODIES
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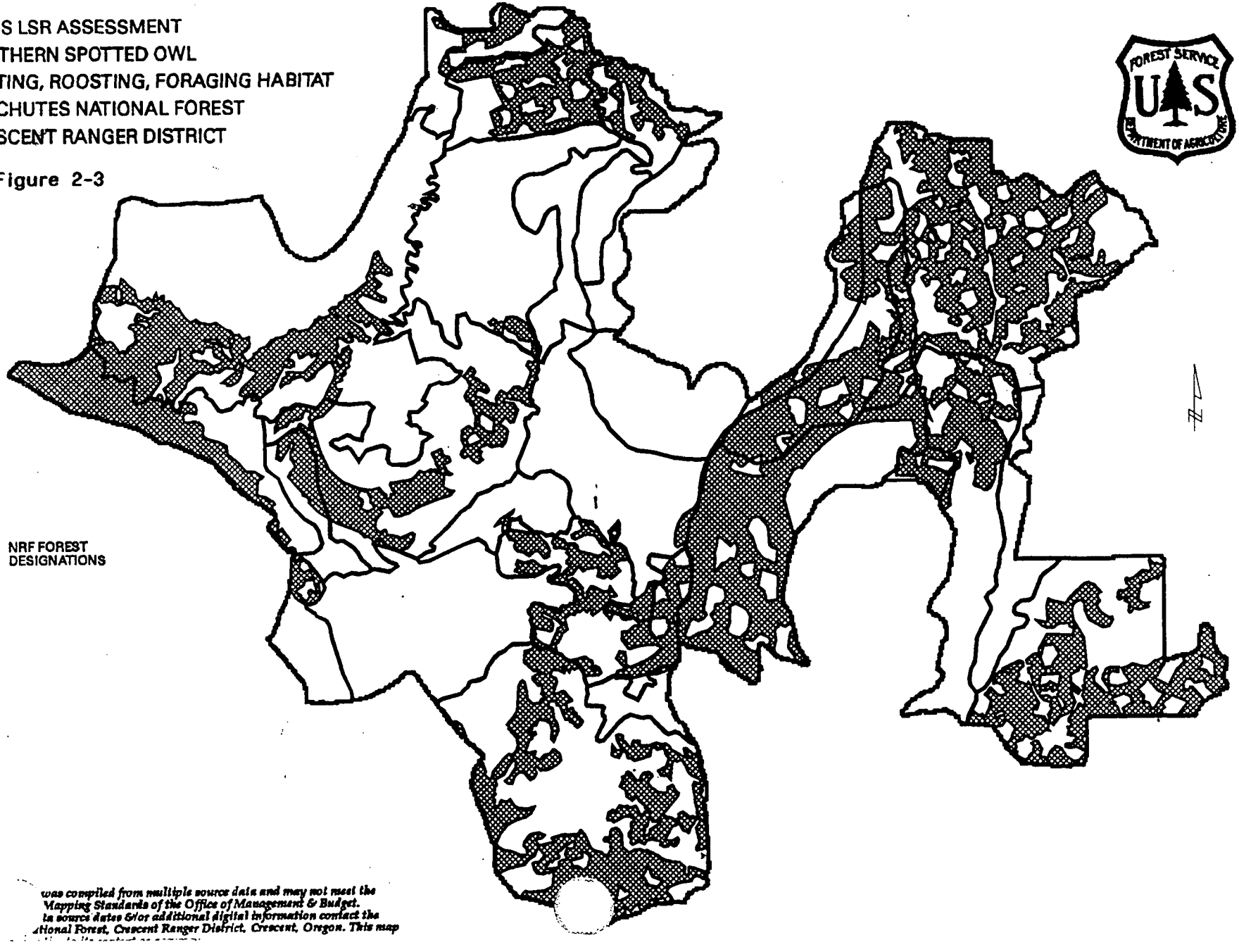
DAVIS LSR ASSESSMENT
NORTHERN SPOTTED OWL
NESTING, ROOSTING, FORAGING HABITAT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 2-3



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DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
MANAGEMENT STRATEGY AREAS CONTAINING
NORTHERN SPOTTED OWL ACTIVITY CENTERS

Figure 2-4

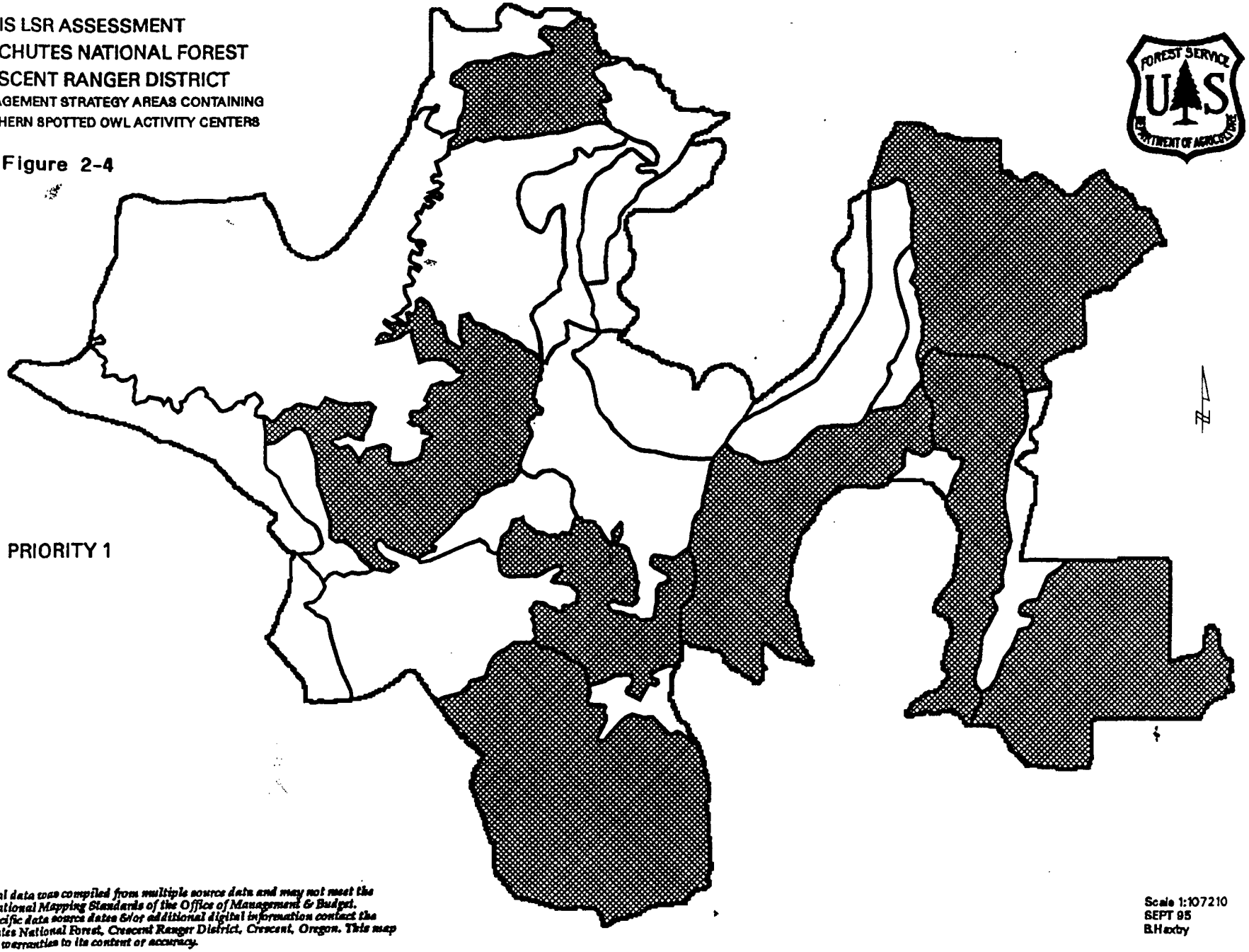

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Table 2 - 1, NRF Habitat Within 0.7 Mile and 1.2 Mile Radii

	0.7 Mile Radius		1.2 Mile Radius	
Owl Number	NRF Acres	% NRF	NRF Acres	% NRF
2011	511	52%	909	31%
2004	251	25%	383	13%
2001	367	37%	1,028	36%
2010	359	36%	861	30%
2002	571	58%	1,392	48%
2006	687	70%	1,720	59%
2008	388	39%	1,063	37%
2003	407	41%	944	33%

If there is less than 50% suitable NRF habitat within the 0.7 mile radius or less than 40% within the 1.2 miles radius, then the owl is considered to be in the "take" category. This implies that further degradation or modification of the habitat which results in a change from NRF to non-NRF will constitute a "take" under the Endangered Species Act.

BLACK-BACKED WOODPECKER COMPONENT

There are documented current and historical sightings of the black-backed woodpecker within the LSR. Currently 23% of the LSR or 11,369 acres exists as black-backed habitat. Density levels of black-backed woodpeckers are most likely high in response to the recent beetle epidemic, however, no surveys have been completed.

Approximately 13,463 acres within the LSR are located in the lodgepole pine PAGs. An additional 4,793 acres exist in the mountain hemlock PAG. Although lodgepole pine is considered optimal habitat in the eastern Cascades, black-backed woodpeckers are also documented in the mountain hemlock PAG. Because this woodpecker is using mountain hemlock, and because other similar woodpecker species, such as the three-toed woodpecker, are believed to utilize these stands, the acreages from both PAGs were combined to estimate potential habitat in the LSR. Approximately 18,256 acres, or 37% of the LSR is potential habitat for black-backed woodpeckers and other lodgepole pine associated species. (See Figure 2-5)

GREAT GRAY OWL COMPONENT

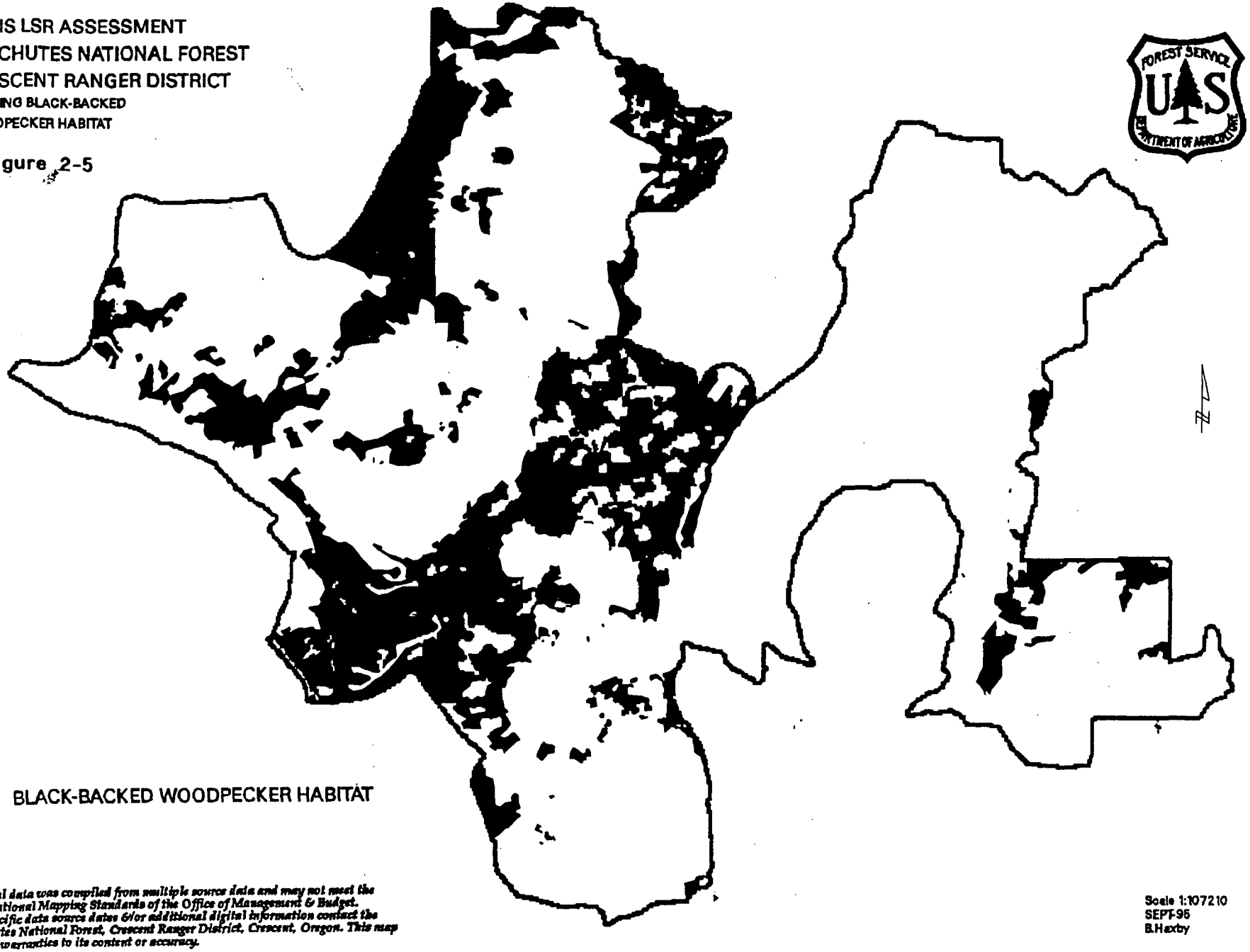
There were no historical sightings of great gray owls in the LSR or on the Crescent Ranger District. Bryan and Forsman (1987), documented great gray owl presence in meadow and riparian habitat adjacent to the LSR (although several miles away). Potential habitat exists around Davis Lake and in meadow habitat along Odell Creek. The probability of occupancy by this species now or in the future is high.

NORTHERN GOSHAWK COMPONENT

There are documented sightings and known goshawk nest sites in the LSR. Habitat for this species exists in the majority of the PAGs throughout the forested areas of the LSR. Optimal habitat is probably encompassed in the northern spotted owl NRF habitat. (Refer to Odell WA for additional information)

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
EXISTING BLACK-BACKED
WOODPECKER HABITAT

Figure 2-5



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AMERICAN MARTEN COMPONENT

Marten appear to be more closely associated with down woody debris levels than with a particular PAG. There have been frequent sightings in 1994 and 1995 across the district in the majority of the PAGs. Track-plate surveys in 1994 just north of the LSR boundary indicated extensive use of beetle-killed lodgepole pine stands. (Refer to Odell WA)

FLAMMULATED OWL AND WHITE-HEADED WOODPECKER COMPONENT

Presence of flammulated owls in the LSR was confirmed in 1994 and 1995. Presence was suspected but not confirmed when the Odell WA was written. (Refer to Odell WA) There are a few historic sightings of the white-headed woodpecker within the LSR. Potential habitat exists, and the probability of utilization is high.

Some areas within the mixed conifer (MC) dry PAG that are at high risk for insect/disease/fire were identified as habitat that should be managed for the white-headed woodpecker and flammulated owl. Some of these selected areas are currently NRF owl habitat but cannot be sustained as such. These areas could receive minor treatment, i.e. thinning, and would serve as optimal habitat for flammulated owls and white-headed woodpeckers for the next few decades.

Concurrently these areas would remain NRF habitat for owls but would be at the lower end of the suitable habitat range in the short-term. Treated areas would act as a safety net to ensure that not all of the NRF habitat within the home range of an owl pair is lost to insect/disease/fire. In the long-term, the treated areas would return to optimal NRF habitat, and another area within the MC Dry PAG could be lightly thinned to function as habitat for the flammulated owl and white-headed woodpecker.

NORTHERN BALD EAGLE COMPONENT

Existing and potential habitat for bald eagles are believed to be adequately represented by the current forest land allocations: the Bald Eagle Management Areas (BEMAs) and the Bald Eagle Consideration Areas (BECAs). There are 4,291 acres of BEMA and 7,857 acres of BECA in the LSR. (See Figure 2-6) These two land allocations overlap such that the BECAs encompass the BEMAs. About 17% of the LSR is existing and potential habitat for bald eagles and ospreys.

The following BEMAs and BECAs are located within the LSR:

- Odell Lake BEMA and BECA - This is an important dispersal corridor for owls over the Cascades. The habitat more closely resembles westside owl habitat which is sustainable for long periods of time without management.

- Davis Lake West BEMA and BECA - These areas provide habitat for flammulated owls, white-headed woodpeckers, pygmy nuthatches, as well as providing roost and nest sites for ospreys and eagles.

- Davis Lake East BEMA and BECA - These areas provide habitat for eagles, osprey, and the spotted owl.

ELK COMPONENT

Two key elk habitat areas are located in the LSR. (See Figure 2-7) These areas delineated in the DNF LRMP were designated in cooperation with the Oregon Department of Fish and Wildlife. The Key Elk

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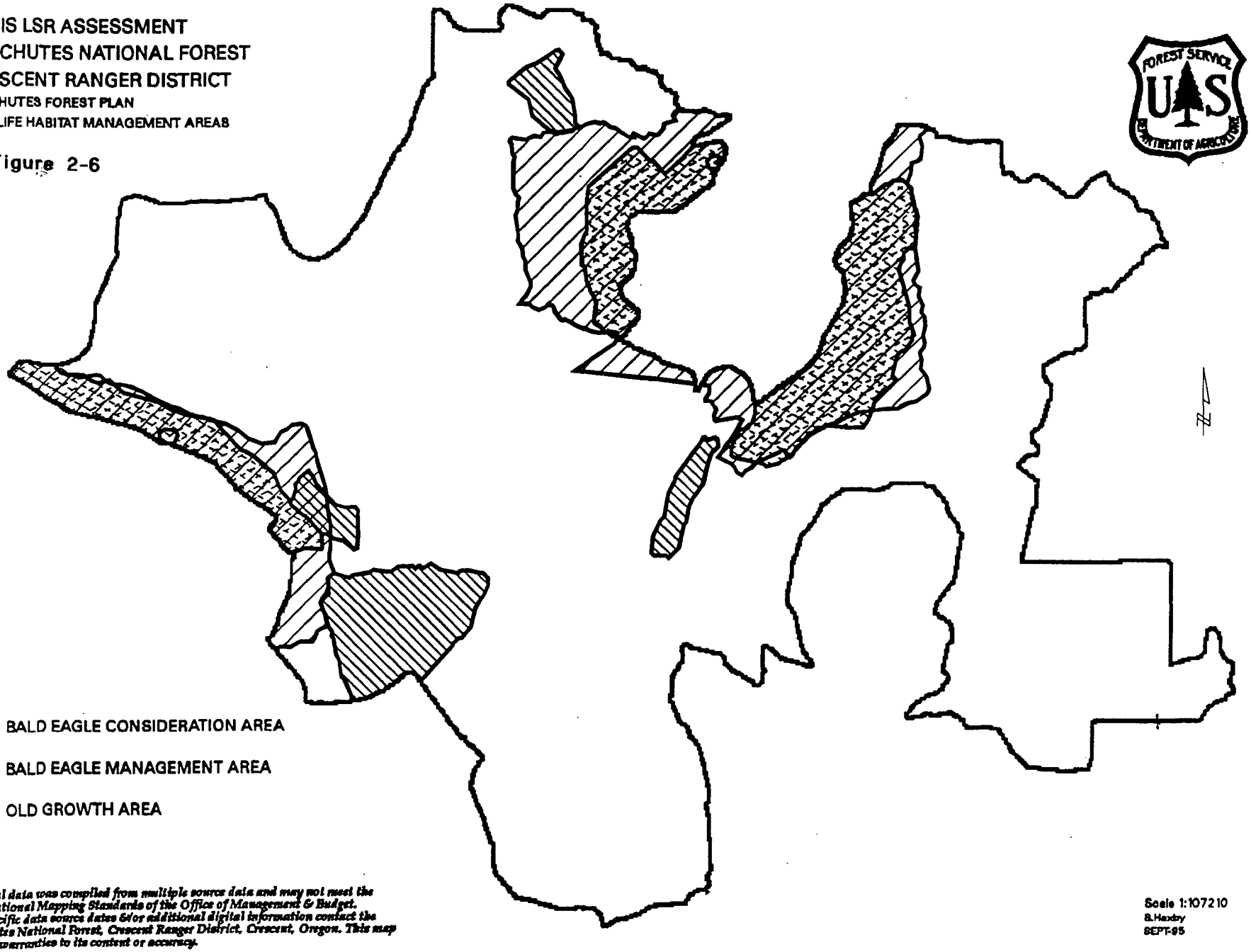
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
DESCHUTES FOREST PLAN
WILDLIFE HABITAT MANAGEMENT AREAS

Figure 2-6



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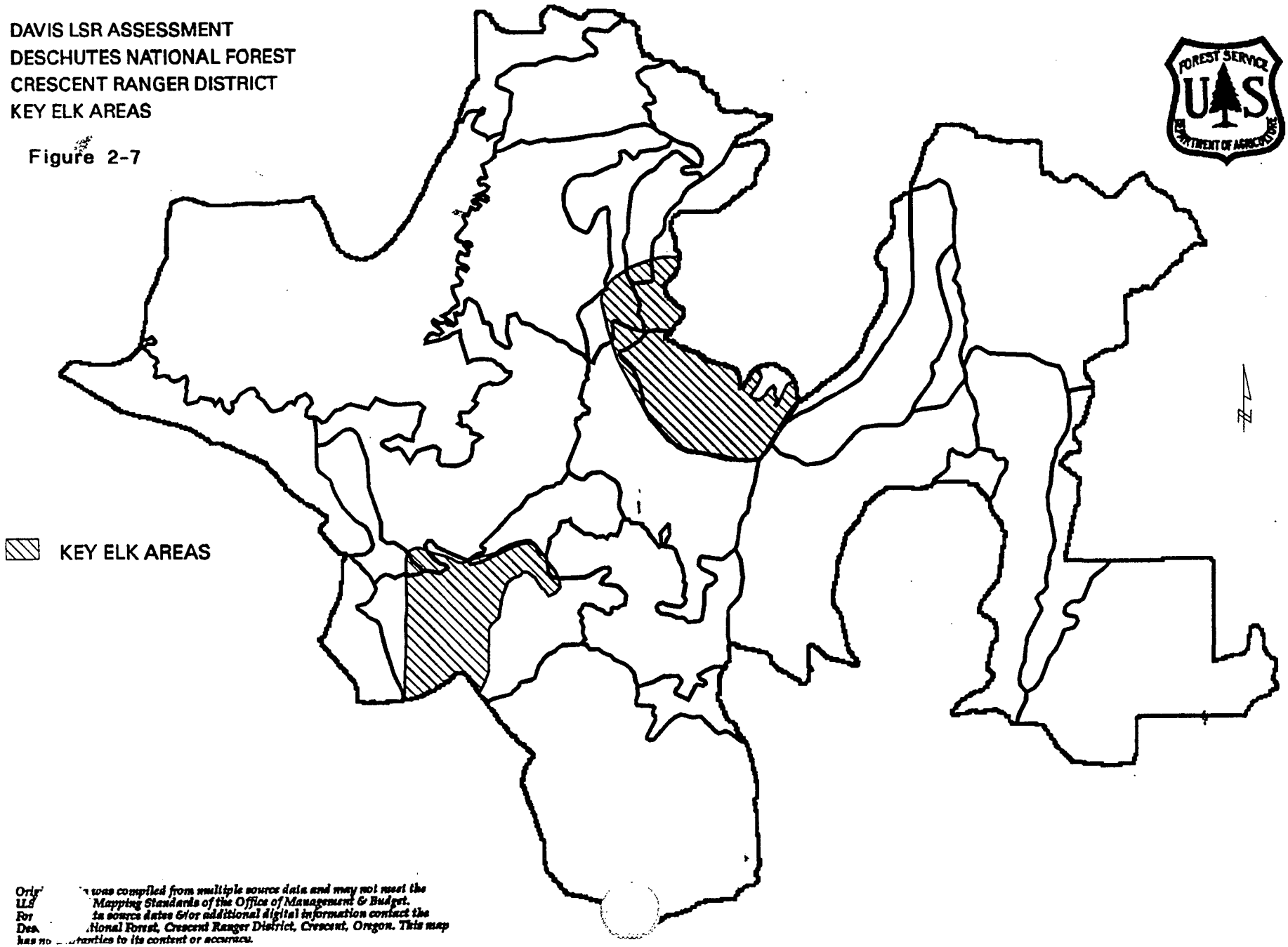
DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
KEY ELK AREAS

Figure 2-7



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Management Areas provide important calving grounds for the species, in addition to both summer and winter habitat.

RIPARIAN COMPONENT

The Odell Pilot Watershed Analysis provided a thorough analysis of the riparian habitats within the Davis LSR. Riparian Reserves were delineated and their functions for riparian related species were documented. This information was used to help determine opportunities within the Davis LSR to provide habitat for riparian related species (See Figure 2-8).

CONNECTIVITY COMPONENT

The degree of fragmentation/connectivity of owl NRF habitat between activity centers within the LSR and connectivity between Davis LSR and adjacent LSRs was examined. The dispersal corridors identified in the Odell WA were considered. The areas between activity centers and adjacent LSRs where management to reduce fragmentation should occur were mapped.

Intact habitat connectivity corridors were not delineated but were incorporated into the composite map, e.g. the contiguous forest running northeast from Hamner Butte to Saddle Butte. The following paragraphs summarize the logic and objectives that were utilized to map the habitat connectivity corridors. (Figure 2-10)

Owl activity centers and home ranges were used to design a network of contiguous habitat in the LSR. It was recognized that this habitat connectivity is desirable for owl dispersal. This connectivity may also be beneficial to other plant and animal species especially those that are less mobile than the owl and have limited dispersal capabilities, e.g. lichens, arthropods, amphibians, fungi, etc. However, there is not enough information available on these species to conclude that the connectivity designed for the spotted owl will be functional for these other plant and animal species.

- Habitat Connectivity #1 - Objective: Provide contiguous habitat in the mixed conifer PAG between the Moore Creek and Maklaks Mountain activity centers. This corridor is considered to be a very high priority, because it is desirable to promote genetic exchange and facilitate dispersal of the spotted owl into the Cultus LSR 10 miles north.

- Habitat Connectivity #2 - Objective: Reduce habitat fragmentation to promote successful dispersal of young owls from the Ringo Butte activity center. This corridor is considered to be a high priority because the owls occupying Ringo Butte are living in the lowest quality habitat that exists at the eastern edge of the owl's range. These birds have adapted to somewhat different habitat, and it is important to pass on their genetic material to other eastside owls.

- Habitat Connectivity #3 - Objective: Reestablish an east-west link between Hamner-McCool-Maklaks activity centers.

- Habitat Connectivity #4 - Objective: Reestablish a block of habitat to provide dispersal habitat between Royce and McCool activity centers and tie into the eastside-westside dispersal corridors. This area could contribute to a contiguous block of habitat in the more sustainable mixed conifer wet PAG.

- Habitat Connectivity #5 - Objective: Provide connectivity between Davis LSR and the Brown's LSR, 3-5 miles to the north.

- Habitat Connectivity #6 - Objective: Provide connectivity between Ringo-Saddle-Davis activity centers.

Refer to the "Deschutes National Forest LSR Overview" section in Chapter 1 for more discussion on connectivity between LSRs and other surrounding land allocations.

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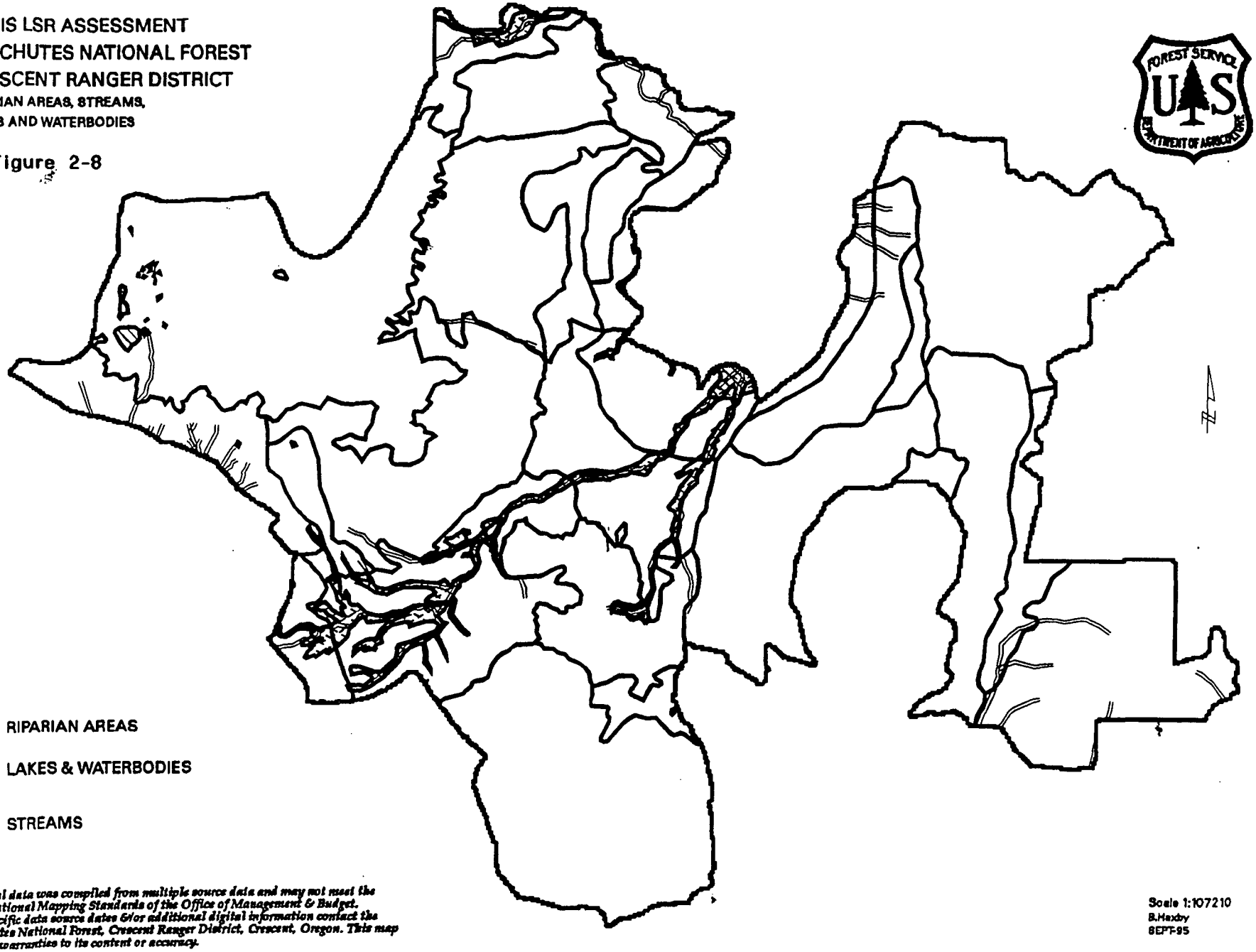
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
RIPARIAN AREAS, STREAMS,
LAKES AND WATERBODIES

Figure 2-8



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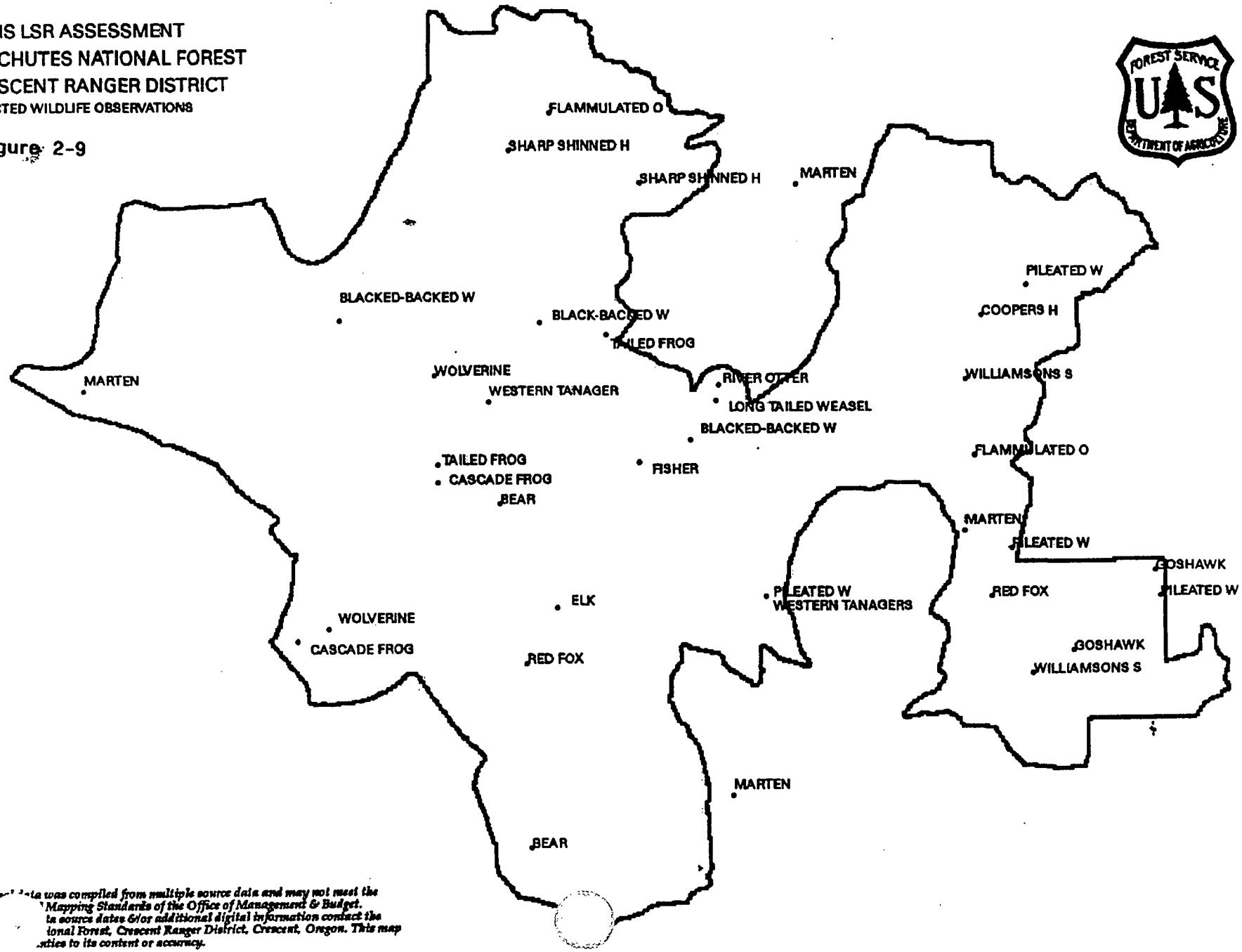
DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
SELECTED WILDLIFE OBSERVATIONS

Figure 2-9



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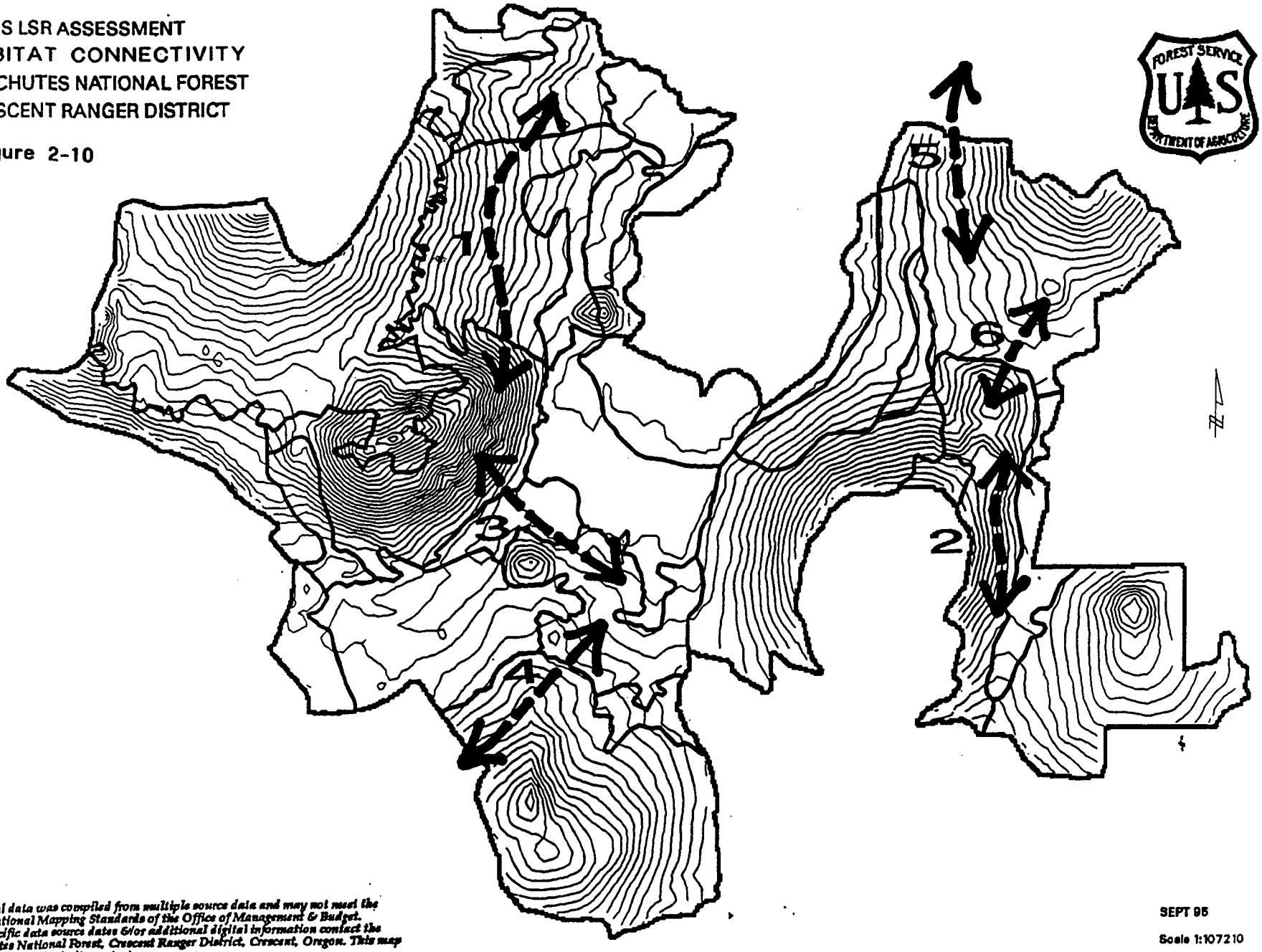
HABITAT CONNECTIVITY
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 2-10



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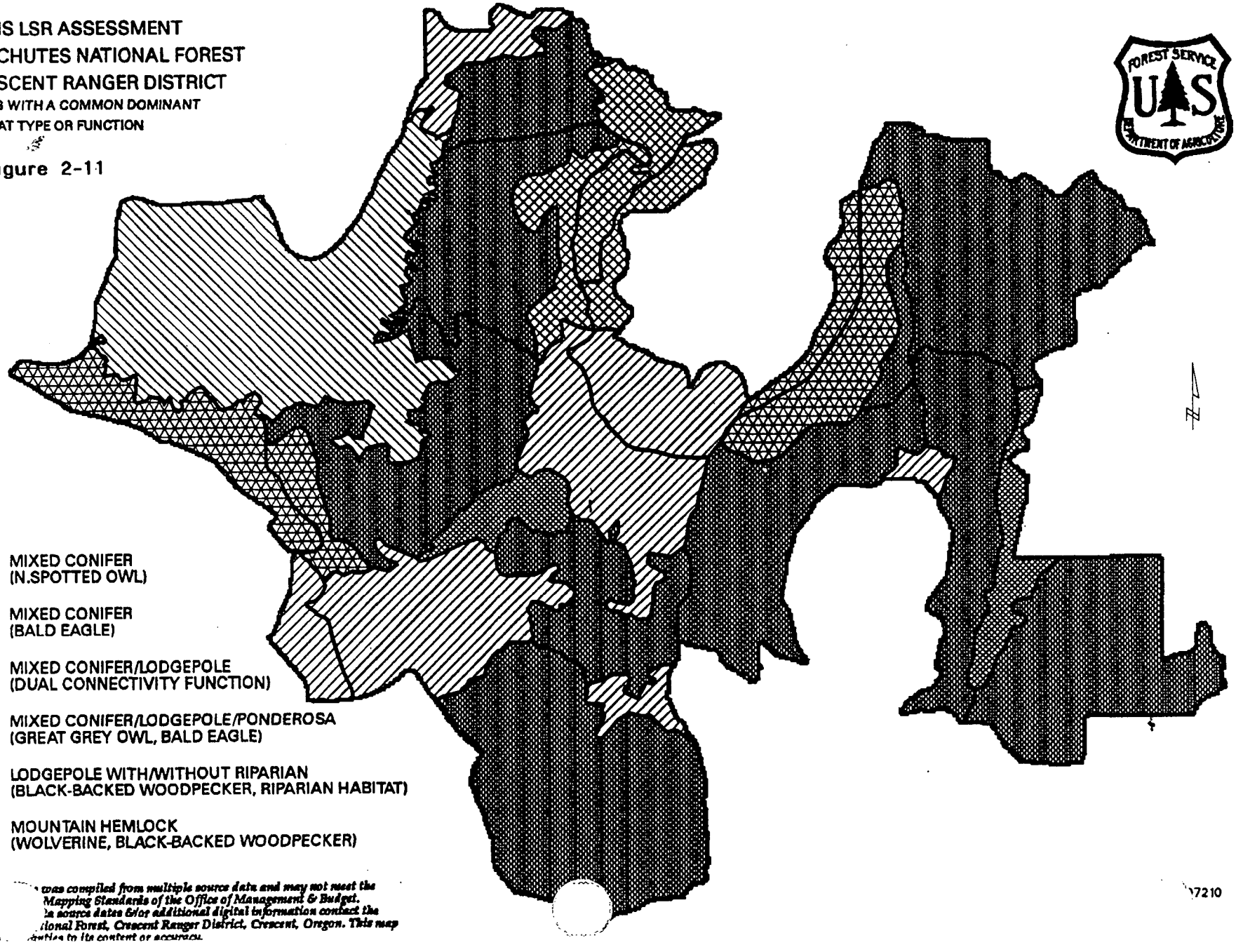
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
AREAS WITH A COMMON DOMINANT
HABITAT TYPE OR FUNCTION

Figure 2-11



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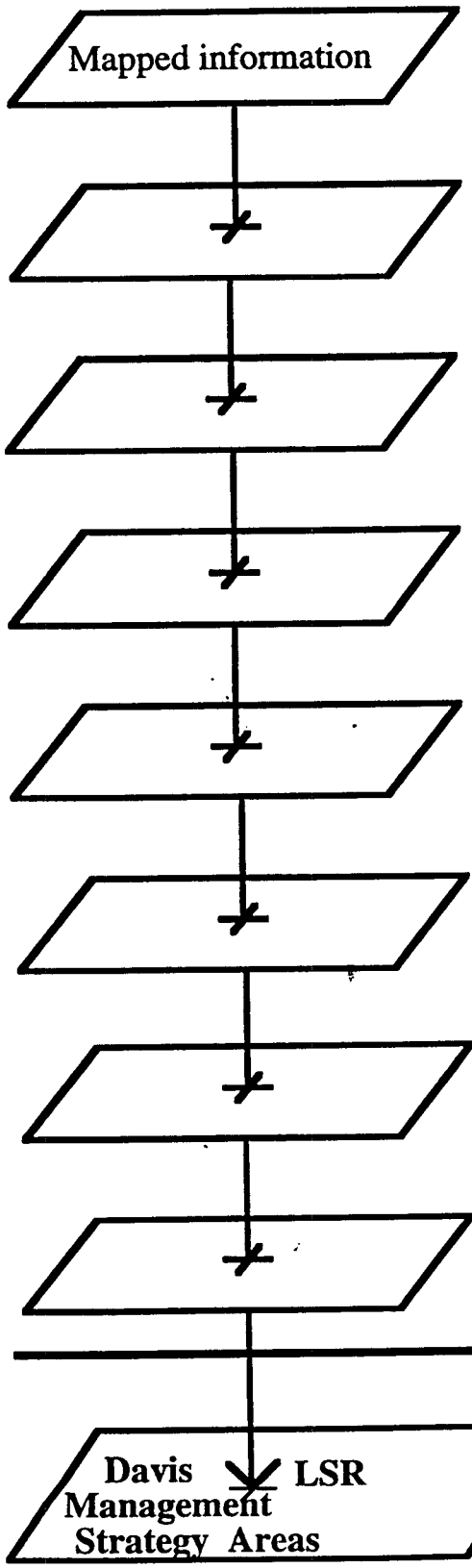
Where and when are forest management activities needed to protect and enhance the existing and potential habitat for late-successional and old growth related species within the Davis Late-Successional Reserve (LSR)?



Areas within the Davis LSR that share a common dominant habitat type and function for late-successional and old growth related species.

Existing forested areas in late and old structured condition.

Areas of past timber harvest activities - regenerated areas.

Existing Fire Hazard and Existing Fire Risk - risk of catastrophic loss of existing late and old structured forest due to fire.

Forest Health - risk of catastrophic loss of existing late and old structured forest due to insects and disease.

Plant Association Groups - potential habitat for sensitive plants, noxious weeds, and indicator of soil quality.

Landscape Areas from the Odell Pilot Watershed Analysis - sets the overall social, physical, and biological context for Davis LSR.

1990 Deschutes Forest Plan land allocations and Crescent Travel and Access Opportunities and Restrictions.

A base map delineating specific areas within the Davis LSR to develop management objectives and criteria for the protection enhancement of late-successional and old growth related species.

Figure 2-12

Where and when are forest management activities needed to protect and enhance the existing and potential habitat for late-successional and old growth related species within the Davis LSR?

The map generated by answering the first key question, "Areas with a Common Habitat Type or Function," was used as the base map for delineating specific areas where activities are needed to protect and enhance late-successional habitats within the LSR. Figure 2-12 illustrates the additional information that was used to subdivide these habitat areas into smaller areas that better reflect the diversity of existing conditions such as the varying levels of fragmentation, or the amount of existing vegetation in a late-successional condition. These smaller, subdivided areas are referred to as Management Strategy Area (MSAs).

The following is a description of each component that helped determine the existing condition of the late-successional habitats within the Davis LSR and delineate the twenty-eight Management Strategy Areas.

EXISTING LATE AND OLD STRUCTURED FORESTED AREAS COMPONENT

Existing forested areas having a late and old structured (LOS) condition were mapped. This information was obtained in the following manner: size structure polygon information from the Landsat (PMR Data) maps was combined with specific stand information in the Geographic Information System (GIS) stand database to model the LOS stands. The Landsat (PMR) information was tested in the field to help create a query that best reflected the LOS conditions within the Davis LSR plant association groups (See Figure 2-13).

PAST TIMBER HARVESTING COMPONENT

Regenerated areas are stands where past regeneration harvest activities occurred and reverted the vegetation to an early successional stage. Typically, the harvest activities that occurred were clearcuts, seed-tree harvest, and shelterwood. These stands were identified on orthophotos.

FIRE COMPONENT

The natural disturbance regimes, existing fire hazard, and fire risk were determined. Fire hazard relates to the severity of wildfire occurrence based on existing fuel profiles and risk relates to the probability of fire occurrence based on ignition sources (human v. lightning).

Fire management planning has been identified as a critical component of Late-Successional Reserve assessment planning east of the Cascade Mountains (ROD, Standards & Guidelines). Large-scale disturbance has the potential to eliminate old-growth and late-successional habitat on hundreds or thousands of acres by limiting the critical structural components of eastside late-successional habitat. Furthermore, the alteration or elimination of fire as a natural process in fire-dependent ecosystems (Davis LSR) is known to threaten the existence of plant and animal species adapted to such conditions (Swanson 1994). For these reasons, fire management planning becomes a significant issue in late-successional and old-growth management.

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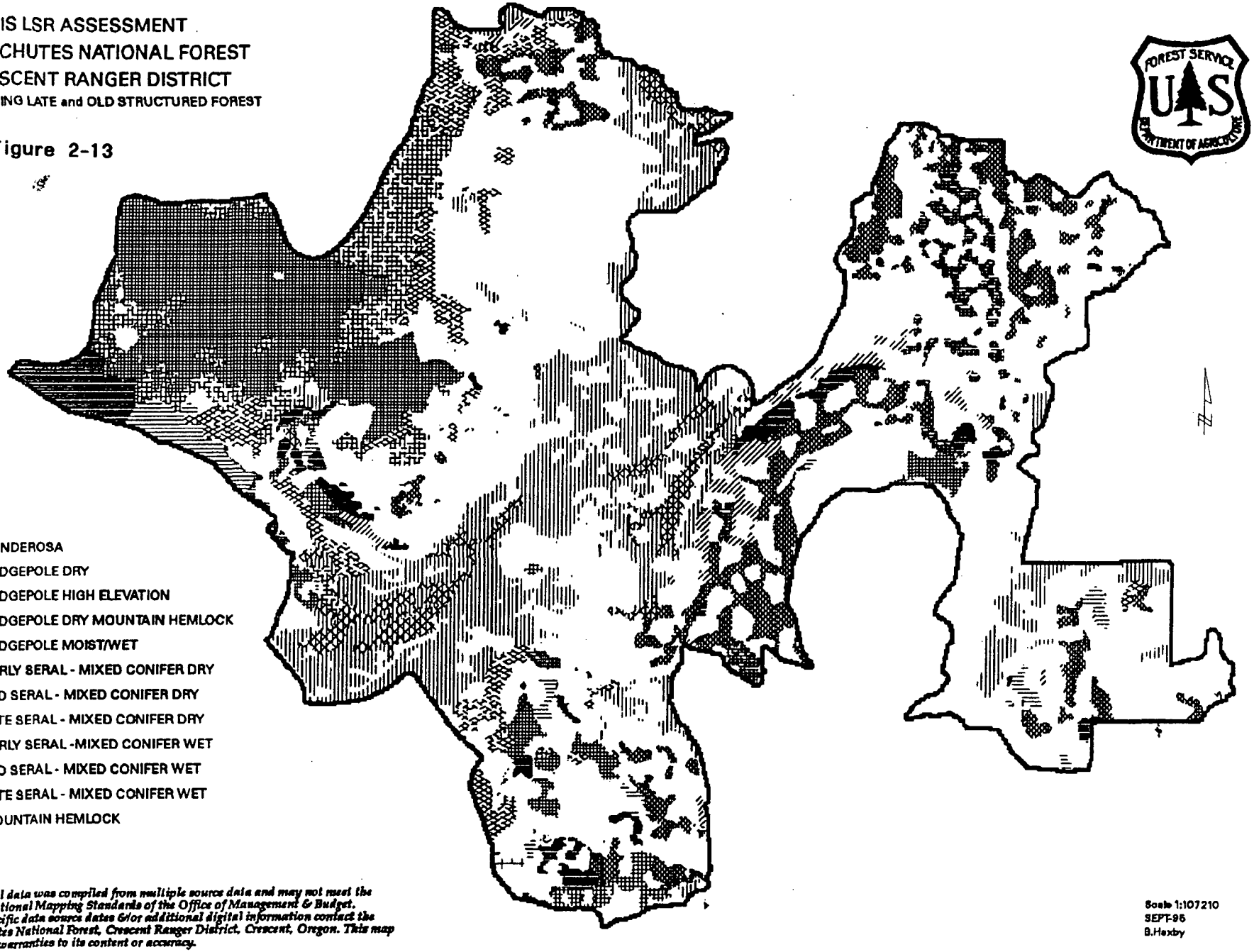
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
EXISTING LATE and OLD STRUCTURED FOREST

Figure 2-13



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B.Hexby

Historic Conditions and Natural Disturbance Regimes

Fire is a natural process that has played a role in shaping the landscape of the Davis LSR Area. Fire suppression and the effects of fire exclusion have also played a role in shaping the current landscape patterns. (Metolius WA, Heath 1995) "Fire changes an ecosystem, community and population structure either by selectively favoring certain species or creating conditions for new species to invade. It usually favors early successional species, but sometimes can accelerate succession to favor late successional species." (Agee 1993).

Ponderosa Pine PAG

Approximately 1,320 acres or 2.7% of the Davis LSR falls within the ponderosa pine (PP) disturbance regime.

This particular PAG typically falls into a low severity fire regime. Historically, fires were of low intensity, rarely scorching the crowns of the mature trees. Frequent underburns killed most of the small understory trees which colonized the sites during brief fire-free intervals, maintaining an open park-like appearance. (Agee 1992) These open, park-like stands had substantial grass and forb cover. (Wickman 1992, Heath 1995) Frequent, light burning allowed bunchgrasses and most forbs to recover rapidly, so the herbaceous vegetation dominated the understory.

Fuels were rarely at high levels because frequent fires (every 1-25 years) consumed forest floor fuels and pruned residual trees. The average crown closures of these stands was likely less than 50 percent.

Mixed Conifer (Dry and Wet)

Approximately 7,142 acres of mixed conifer wet (MCW) and 19,089 acres of mixed conifer dry (MCD) are located within the Davis LSR. Together the mixed conifer PAGs constitute 26,231 acres or 53.7% of the LSR.

This PAG typically falls into a moderate/high severity fire regime. Agee (1992) believes that historically, the mixed conifer forests show the most frequent fire activity of all Eastside forests, although cooler, wetter sites, i.e. mixed conifer wet, have longer fire return intervals. Frequent fires in drier plant association groups are likely due to higher productivity, when compared to the ponderosa pine associations. After a fire, the fine dead fuels needed to carry another fire are more rapidly replaced in the mixed conifer associations.

Fire return intervals were estimated by Bork (1995) at 9 to 25 years. Hopkins estimates them to be 30 to 50 years in the lower elevations (1500 to 4000 feet) and 50 to 80 years in the higher elevations (4000 to 5000 feet). McNeil and Zobel (1980) found an increasing fire-return interval with elevation. The average fire return interval was 9 to 42 years along an elevation gradient. Fire return intervals in mixed conifer are quite variable and a specific fire regime for the entire area is difficult to determine.

Hopkins (1995) estimates the average fire size for low intensity fires ranged from 50 to 100 acres and that stand replacement fires were 200 to 500 acres in size.

Mountain Hemlock (Subalpine Ecosystem)

Approximately 4,584 acres or 9.4% of the LSR is located in the mountain hemlock (MH) PAG. This PAG typically falls into a high severity fire regime.

Fire is the primary large-scale disturbance factor in the high elevation forest. Due to the lack of fire resistance of the major tree species in these forests, most fires are stand replacement events. The estimation of fire intensity in high elevation forests is complicated by the erratic, often weather-driven nature of these fires (Agee, 1993). Crown fires can occur when foliar moistures are low and may be aided by lichen draped within the canopy.

Fire return intervals are typically in the 200-300 year range. In normal to somewhat unusual years, a fuel-limited situation for crown fire development exists, but in very unusual years, large-scale crown fires will burn regardless of the fuels situation.

Lodgepole Pine (Wet & Dry)

Approximately 7,399 acres of lodgepole dry (LPD) and 1,189 acres of lodgepole wet (LPW) account for 17.6% of the landbase.

The lodgepole pine PAGs typically fall into the moderate severity fire regime category. Fire frequency is not well documented for these forests. The average fire-return interval is most likely in the range of 60-80 years, with areas surrounded by higher productivity forests at the lower end of the range. The magnitude of natural fires ranges from slowly burning logs across the forest floor to crown fires.

Climax lodgepole pine forests rarely grow for a century without a major disturbance by fire or insects.

Existing Condition

Management activities, primarily fire exclusion, and to a lesser extent, stand management, have had significant effects on vegetation and fire regimes within the Davis Late-Successional Reserve area. The development of a heterogeneous landscape pattern has been interrupted by fire suppression, allowing regeneration and more shade-tolerant species to colonize the landscape. Consequently, the structural architecture of the vegetation has been altered both horizontally and vertically. The spatial distribution of a mosaic of clumped groups and of even-aged trees has been replaced by larger, denser, patches of shade-tolerant vegetation. The subsequent increase in the vertical continuity of vegetation and fuelbeds allows surface fires to develop into understory or crown fires under moderate weather conditions (Newberry Fire 1995). Concurrent to the increase in average fire intensity, average fire tolerance of vegetation is decreasing as a result of shading and overstocking.

Risk Analysis

In conjunction with high fire hazard; recreational use, urban interface, social activities, and lightning occurrences have resulted in a relatively moderate fire occurrence rate within the Davis LSR area. Since 1940, a total of 249 fires, 144 lighting-caused and 105 human-caused, have occurred within the LSR.

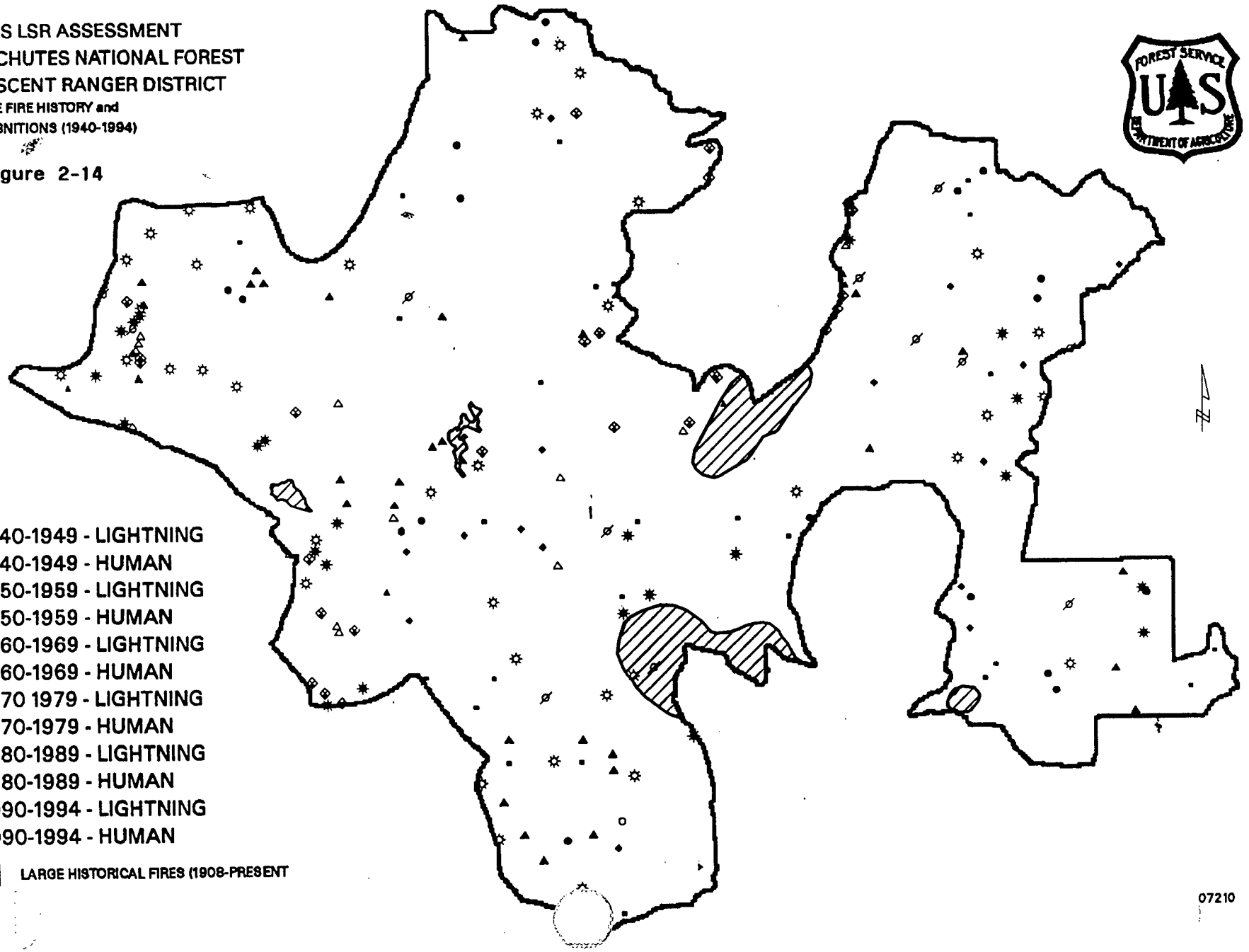
The following charts demonstrate the criteria used to determine hazard and risk ratings of Low, Moderate, and High:

HAZARD RATING	LOW	MODERATE	HIGH
Flame Length	1-2'	3-6'	6-8'
Flame length intensity = FLI	40-60	60-120 btu/ft	120-200
Rate of Spread" ROS ft/sec	1-2'	2-10'	10-30

RISK RATING	LOW	MODERATE	HIGH
Total # of Fires (1940-1994)	0-10	11-19	20 +
*Risk rating some MSA's may differ from paramaters set due to other considerations (ie access, public use, etc.)			

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
LARGE FIRE HISTORY and
FIRE IGNITIONS (1940-1994)

Figure 2-14



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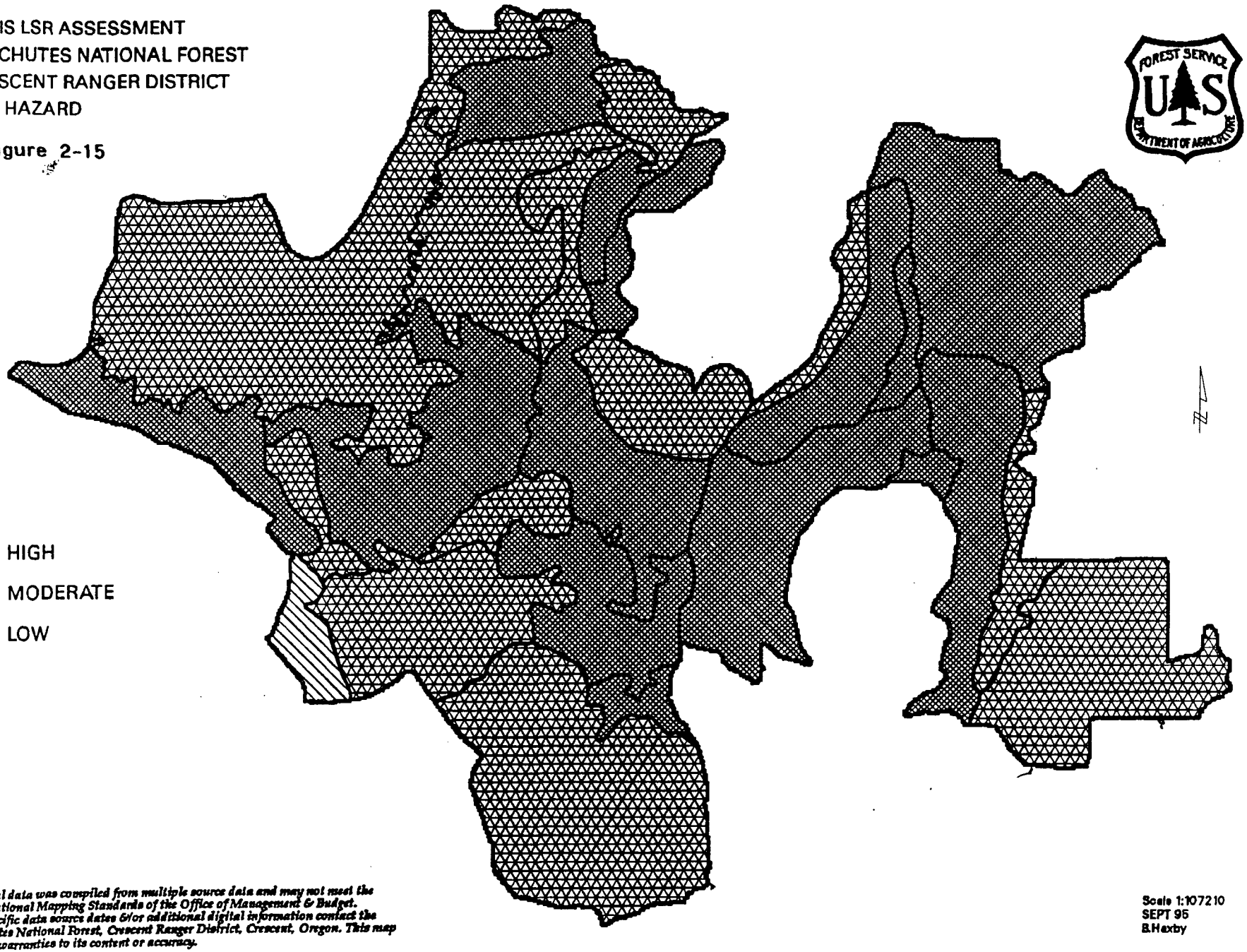
CRESCENT RANGER DISTRICT
FIRE HAZARD

Figure 2-15



Original data was compiled from multiple source data and may not meet the U.S. National Mapping Standards of the Office of Management & Budget. For specific data source dates &/or additional digital information contact the Deschutes National Forest, Crescent Ranger District, Crescent, Oregon. This map has no warranties to its content or accuracy.

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DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
FIRE RISK

Figure 2-16

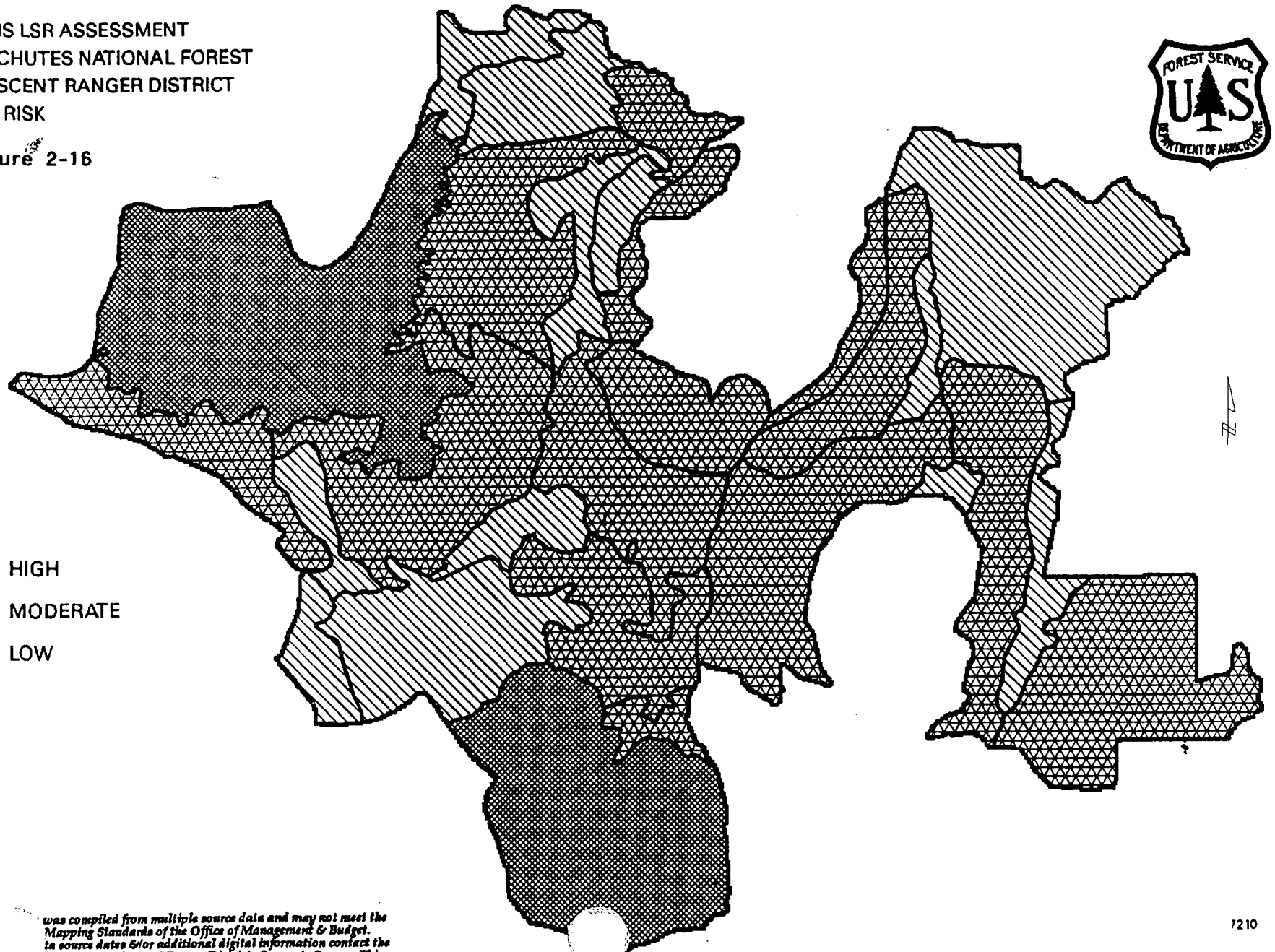

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Table 2 - 2, Historical Fire Occurrence

Hazard Rating	MSA	Total # Fires (1940-1994)	# Lightning (1940-1994)	# Human (1940-1994)	Risk Rating
Moderate	A	3	3	0	Low
High	AA	2	1	1	Moderate
Moderate	B	37	25	12	High
Moderate	BB	24	22	2	High
High	C	6	5	1	Low
Moderate	D	0	0	0	Low
Moderate	E	5	5	0	Moderate
Moderate	F	0	0	0	Low
High	G	0	0	0	Low
High	H	8	5	3	Moderate
High	I	17	3	14	Moderate
Moderate	J	2	0	2	Low
High	K	17	13	4	Moderate
High	L	14	5	9	Moderate
Moderate	M	6	0	6	Moderate
Moderate	N	27	3	24	Moderate
High	O	2	1	1	Moderate
High	P	1	1	0	Low
High	Q	16	14	2	Low
Moderate	R	3	3	0	Low
High	S	11	9	2	Moderate
Moderate	T	12	10	2	Moderate
High	U	0	0	0	Low
High	V	7	5	2	Moderate
High	W	8	5	3	Moderate
Moderate	X	3	3	0	Low
Moderate	Y	3	3	0	Low
Low	Z	1	1	0	Low

See Figures 2-15 and 2-16 for fire hazard and fire risk.

FOREST HEALTH COMPONENT

Within the past several decades there have been some very significant impacts from insects and disease on forested stands and tree species. Beginning in the 1930s it was recognized that the white pine blister rust (*Cronartium ribicola*) was a significant problem for the 5-needle pines across the continent. In the 1970s, the Douglas-fir tussock moth (*Orgyia pseudotsugata*) reached epidemic proportions in several western states. About the same time, the Dutch elm disease (*Ceratocystis ulmi*) was killing most of the elm in the United States. Within the last decade, the mountain pine beetle (*Dendroctonus ponderosae*) has killed most or all of the overstory lodgepole pine on hundreds of thousands of acres in central Oregon alone. In addition, the western spruce budworm (*Choristoneura occidentalis*) has killed true firs, Douglas-fir, spruce, and western larch on thousands of acres in northeastern and central Oregon.

These infestations have resulted in serious ecosystem, economic, and aesthetic losses across the country. Recognition of the potential impact insects and diseases can have on the Davis LSR is critical to meeting the goals and objectives of the LSR. As discussed in the LRMP, prevention of pest problems is preferable over suppression activities. Evaluation of the risks varies with the different plant associations, with the current plant communities, and with the vegetative disturbance history for a given site.

It seems that whenever there is a large amount of forest vegetation in a fairly narrow range of conditions, there is also a corresponding pest or range of pests able to thrive under those conditions.

Listed below is a summary of the different levels of risk to large scale insect and disease losses in the Davis LSR. These risks are summarized by landscape area (Odell WA) in an attempt to tie the risks in with the management objectives and options currently in effect. (See Figure 2-18 for the location of the landscape areas within the Davis LSR)

The discussion includes the most likely scenarios, but caution is advised in thinking that these are the only possibilities. For example, during extended periods of drought, these conditions, in conjunction with normal levels of pests, can cause mortality when typically a healthy stand could resist these factors. Risks are subjectively determined using a combination of sensitivity and resiliency to determine the overall risk for the landscape area. Most regeneration units are assumed to be low, so the risks are assessed on the unmanaged portions of each of these landscape areas.

Central Conifer Association

The overall risk is high, especially in unmanaged stands. This area is primarily characterized by unmanaged mature and overmature stands of mixed conifer fragmented by managed regeneration patches of primarily ponderosa pine, Douglas-fir, and areas of heavy natural regeneration of lodgepole pine.

The managed stands of regeneration are susceptible to the typical pests common in all regeneration areas on the Crescent District. These pests include: Dwarf-mistletoe from adjacent trees or stands; tip borers; needle blights; and miscellaneous animal pests.

The unmanaged or previously lightly entered mature and overmature stands are susceptible to a fairly wide range of insect and disease pests. These stands presently have a relatively low density of large, overmature trees with very dense understory vegetation comprised of more shade tolerant later seral species. The overstocked condition of these stands is beginning to show in the amount of overstory mortality.

Overstory mortality is mostly due to the mountain pine beetle and western pine beetle (*Dendroctonus brevicomis*) in the pines, and fir engraver beetle (*Scolytus ventralis*) in the firs. The Douglas-fir beetle (*Dendroctonus pseudotsugae*) may also be found currently at endemic levels in the stands with Douglas-fir. Armillaria root disease (*Armillaria* spp) can affect all of the conifer species on these sites and is found at endemic levels throughout this landscape area.

Mortality in the understory appears to be mostly from competition levels combined with droughty conditions at present.

What might normally be considered endemic levels of dwarf-mistletoe are currently contributing to mortality at all levels in the stand with the present drought conditions.

Odell Lake/Willamette Pass Area

The overall risk is high. This landscape area is very similar to the Central Conifer Association except there is less fragmentation and it contains a larger proportion of mixed conifer wet plant associations.

Davis Lake Area

The overall risk is high. This landscape area is characterized by unmanaged stands of overmature ponderosa pine and mixed conifer dry plant associations with overmature and dead lodgepole pine fragmented by regeneration cuts.

In the lodgepole pine most of the overstory larger than 6 or 7 inches has been killed by mountain pine beetles. The "thinning from above" that the beetles have done has opened these stands up making them more insect and disease resistant and free to grow.

Regeneration stands have similar risks as those in the previous landscape areas.

The ponderosa pine and mixed conifer dry stands are characterized by fairly large, well-distributed overstory ponderosa pine and Douglas-fir, usually over 200 years old, with a very dense understory of lodgepole pine and true firs developing. Ponderosa pine and mixed conifer areas are similar to that of the Central Conifer Association. Lodgepole pine areas are similar to those of the East Odell Creek Landscape Area.

Mountain Hemlock

The overall risk is moderate. Large, contiguous stands of mountain hemlock, western white pine, and lodgepole pine with scattered other conifer species characterize this landscape area. Little fragmentation has occurred in this area.

Very old pockets of laminated root rot (*Phellinus weirii*) are common in this landscape area. White pine blister rust in the 5-needled pines has virtually eliminated the western white pine as a viable species in this area. There are still many standing, live western white pine, but it is difficult to find an individual without the blister rust.

East Odell Creek

The overall risk is moderate. This landscape area is characterized by unmanaged stands of overmature and dead lodgepole pine fragmented by regeneration cuts. The majority of the overstory larger than 6 or 7 inches has been killed by mountain pine beetle. The "thinning from above" that the beetles have done has opened these stands up making them more insect and disease resistant and free to grow.

Regeneration stands have similar risks as those in the previous landscape areas.

West Odell Creek

The overall risk is moderate. Mountain pine beetles have removed some of the overstory on the drier sites. In the wetter sites, spruce beetle (*Dendroctonus rufipennis*) may be on the increase as several newer infestations were observed this year. Stands are currently very dense and little fragmentation has occurred in this landscape area.

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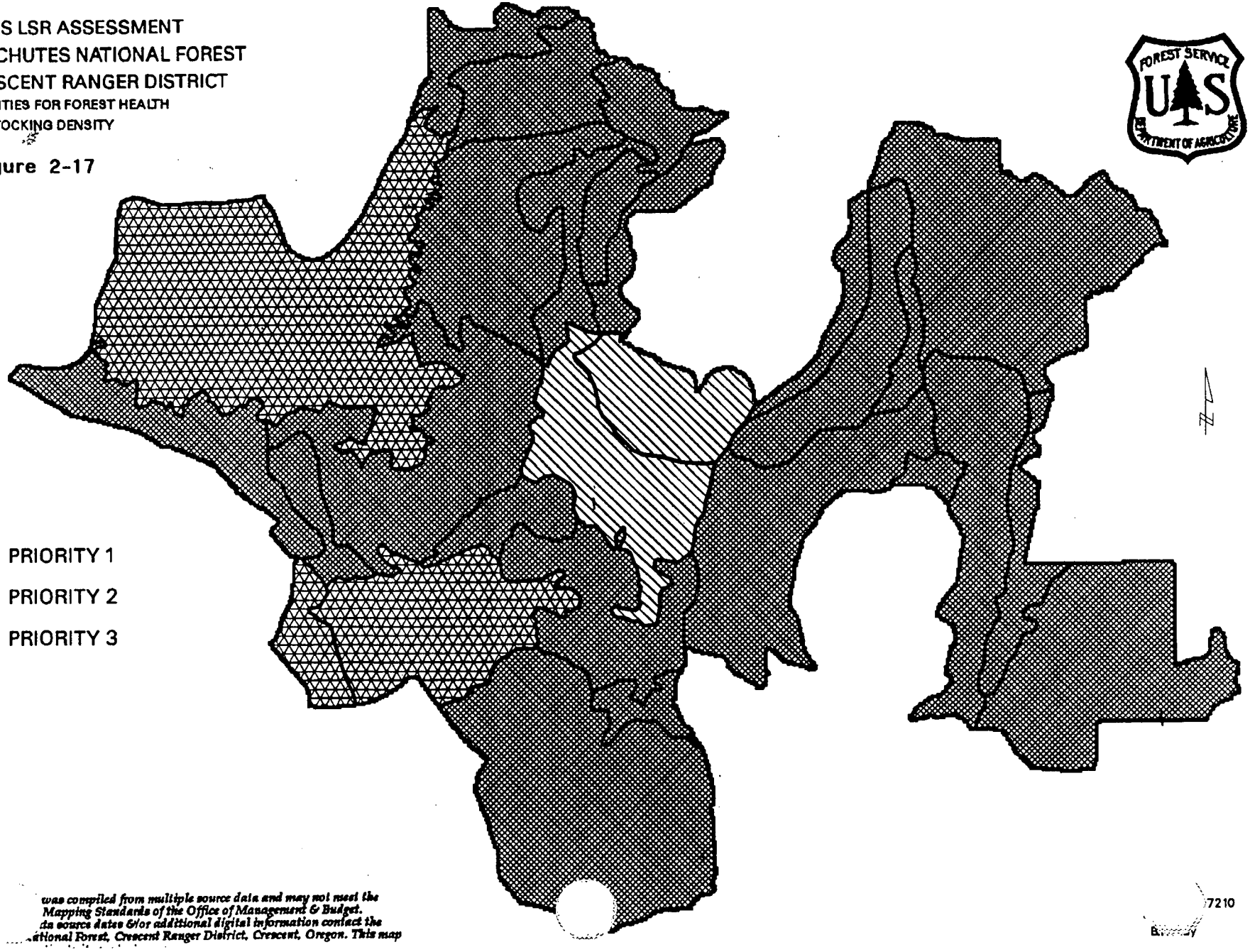
PRIORITIES FOR FOREST HEALTH
and STOCKING DENSITY

Figure 2-17



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US... Mapping Standards of the Office of Management & Budget.
For ... da source dates &/or additional digital information contact the
Desc... ational Forest, Crescent Ranger District, Crescent, Oregon. This map

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Conclusion

Most of the stands which currently meet the desired conditions for LSR are at risk of losing some or all of the desired structural characteristics over the next 10-50 years due to insect or disease infestations on a large scale. Efforts should be made to develop a wide diversity of structure and growing conditions in those landscape areas to increase their sustainability and resilience to insect and disease disturbances. (See Figure 2-17)

BOTANICAL COMPONENT

Forest lands designated as Late Successional Reserves in the Northwest Forest Plan (NWFP) serve several objectives. The plan recognizes that there are a variety of species associated with late-successional forests which play key roles in ecosystem functions. While past attention has focused primarily on late-successional vertebrate species such as the spotted owl, the NWFP addresses biodiversity concerns in a wider context. As one part of the consideration of plant and invertebrate animal biodiversity the plan requires "survey and manage" provisions for species of concern be applied as standards and guidelines common to all land allocations (ROD, C-4).

The survey and manage standard and guideline provides benefits to species of fungi, lichens, bryophytes, vascular plants, invertebrate animals, and other species. The standard and guideline contains four survey and manage strategies which are to be implemented over various timeframes:

1) *Manage known sites*: This strategy should receive the highest priority of the four categories. Activities implemented in 1995 and later must include provisions for these known sites.

2) *Survey prior to ground-disturbing activities*: Efforts to design protocols and implement surveys should be started immediately. Development of survey protocols must begin in 1994 and proceed as soon as possible. Surveys must be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later.

3) *Extensive surveys*: Conduct extensive surveys for the species to find high-priority sites for species management. This stategy is recommended primarily for species whose characteristics make site and time-specific surveys difficult as with species that may take several to many years to locate due to dependence on specific conditions. Surveys under this strategy must be underway by 1996.

4) *General regional surveys*: The objective is to survey for the species to acquire additional information and to determine necessary levels of protection. Species intended to benefit from this standard and guideline are the arthropods, the fungi species that were not classed as rare and endemic, bryophytes, and lichens. These surveys are expected to be both extensive and expensive, but the information from them is critical to successful implementation of ecosystem management. They will be initiated no later than FY 1996 and are to be completed within ten years.

At this time very little specific information exists on most species of concern. Most habitat descriptions are based on few records and will be broadened as new sites are discovered. The following discussion is an effort to assess and apply existing information.

Fungi

No surveys for fungi have been performed in the Davis LSR. Review of the NWFP Appendix J2, which discusses known information on species of concern, lists the following eleven species as occurring within the Deschutes National Forest. Survey and manage strategies are noted for each species.

•Bolete- *Gastroboletus subalpinus* (probably ectomycorrhizal with lodgepole and whitebark pine, and possibly other Pinaceae at elevations from 4,500 feet to timberline.) Known site- Elk Lake, Deschutes National Forest. S&M 1/3. Appendix J2-102.

•Rare bolete- *Gastroboletus ruber* (Closely associated with old-growth mountain hemlock as an ectomycorrhizal fungus. This rare endemic is found at upper mid- to high elevations in mature to old-growth forests with a well-developed humus layer.) Known site- Cabot, Carl, and Shirley Lakes, Mt. Jefferson Wilderness Area, Deschutes National Forest. S&M 1/3. Appendix J2-109.

•False truffle- *Nivatogastrium nubigenum* (Inhabitant of brown-cubical-rotted coarse woody debris on xeric sites at mid to high elevations, in mature to old-growth forests or stands with an abundant legacy of large coarse woody debris.) Known site- Three Creeks Lake, Deschutes National Forest. S&M 1/3. Appendix J2-110.

•False truffle- *Rhizopogon truncatus* (Located in stands of mixed conifers, including Douglas-fir, yellow and white pines, true firs, and mountain hemlock, in moderate to dry sites at relatively high elevations.) Known site- Yoran Lake, Deschutes National Forest. S&M 3. Appendix J2-111.

•Rare false truffle- *Alpova alexsmithii* (Mature and old-growth forests of the Cascade Mountains at mid- to upper mid-elevations, probably ectomycorrhizal with true firs, and possibly other Pinaceae) Known site- Carl Lake, Deschutes National Forest. S&M 1/3. Appendix J2-115.

•Rare false truffle- *Rhizopogon flavofibrillosus* (Associated with mature to old-growth mixed conifer forests at mid- to upper mid-elevations, and occur as ectomycorrhizal associates of the Pinaceae.) Known sites- Three Creeks Lake and Cultus Lake, Deschutes National Forest. S&M 1/3. Appendix J2-122.

•Rare false truffle- *Rhizopogon evadens* var. *subalpinus* (Occurs in upper mid-elevations as ectomycorrhizal fungus of true firs, and possibly other Pinaceae.) Known site- Wickiup Plains and east slope of North Sister, Sisters RD, Deschutes National Forest. S&M 1/3. Appendix J2-133.

•False truffles-Rare Undescribed Taxa- *Hydnotryna*, *Martellia* (Endemic to old-growth Pacific silver fir/mountain hemlock forests of the type locales at 6000 feet) Known site- Shirley Lake, Mt. Jefferson Wilderness, Sisters RD. NOTE: The site notation incorrectly identifies Shirley Lake as in the Willamette NF. S&M 1/3. Appendix J2-151.

•Rare truffle- *Elaphomyces anthracinus* (Found in mature ponderosa pine stands and is a probable ectomycorrhizal associate of pines as well as a wide variety of other ectomycorrhizal hosts.) Known site- Riverside Campground, Sisters RD, Deschutes National Forest. S&M 1/3. Appendix J2-156.

•Rare truffle- *Elaphomyces subviscidus* (Ectomycorrhizal associate with mature to old-growth pines and probably other Pinaceae at mid-elevations.) Known site- Three Creeks Lake, Sisters RD, Deschutes National Forest. S&M 1/3. Appendix J2-157.

•Uncommon gilled mushroom - Ectomycorrhizal- *Hygrophorus caeruleus* (Montane late-successional forest ecosystems). Known site- Sisters RD, Deschutes National Forest. S&M 1/3. Appendix J2-168.

Refer to this list for species of fungi that have potential habitat according to PAGs in each MSA:

Table 2 - 3, Fungi Species with Potential Habitat According to PAG

PAG	Common Name	Scientific Name
Mountain Hemlock	Rare bolete False truffle False truffle - Rare undescribed taxa Uncommon gilled mushroom	*Gastroboletus ruber* *Nivatogastrium nubiginum* *Rhizopogon truncatus* *Hydnotryna* sp. *Martellia* sp. *Hygrophorus caeruleus*
Lodgepole Dry/ Mountain Hemlock	False truffle	*Nivatogastrium nubiginum* *Rhizopogon truncatus*
Lodgepole High Elevation	Bolete	*Gastroboletus subalpinus*
Lodgepole Dry	False truffle	*Nivatogstrium nubiginum*
Mixed Conifer Wet	Rare false truffle Uncommon gilled mushroom	*Alpova alexsmithii* *Rhizopogon flavofibrillosus* *Rhizopogon evadens* var. *subalpinus* *Hygrophorus caeruleus*
Mixed Conifer Dry	False truffle Rare false truffle Uncommon gilled mushroom	*Nivatogastrium nubiginum* *Rhizopogon truncatus* *Alpova alexsmithii* *Rhizopogon flavofibrillosus* *Rhizopogon evadens* var. *subalpinus* *Hygrophorus caeruleus*
Ponderosa Pine	Rare truffle	*Elaphomyces anthracinus* *Elaphomyces subviscidus*

A review of species ranges and habitat requirements found at least 44 additional species which may have potential habitat in the LSR. Most of these fungi are mycorrhizal or ectomychorrhizal species which are found in association with specific host tree species, in this case, with old-growth pine, Douglas-fir, or true firs.

Lichens

Regional lichen surveys were done in 1994 on the Deschutes National Forest. The following survey and manage species were found and may have potential habitat in Davis LSR:

•Rare nitrogen-fixing lichen, *Pseudocyphellaria rainierensis* (In hyper-mesic Cascadian old-growth forests.) Found on Sisters RD. S&M 1/2/3. Appendix J2-228.

•Pin Lichen- *Calicium* sp. (Occurs in sheltered microsites with high atmospheric humidity provided by old-growth forest conditions, often on the underside of large leaning trees.) Known site- Sisters RD. S&M 4

•Riparian Lichen- *Collema* sp. (Presence of hardwoods and increased humidity within riparian areas are critical for this species) Known site- Sisters RD. S&M 4. Appendix J2-239

•Rare Nitrogen-fixing Lichen- *Lobaria hallii* (Variety of late successional forest types--documented on less than 10 sites) Known site- Sisters RD. S&M 1/3. Appendix J2-228.

•Nitrogen-fixing Lichen- *Lobaria pulmonaria, Nephroma helveticum, Nephroma resupinatum, Pseudocyphellaria anomola, Pseudocyphellaria anthrapsis* (Generally do not colonize a forested stand until it is over 140 years old, when the texture of the bark is suitably rough and the microclimate is ameliorated by the multilayered canopy). Known sites-Sisters RD. S&M 4. Appendix J2-232.

No surveys of lichens have been performed in Davis LSR. Review of the NWFP Appendix J2, which discusses known information on species of concern, lists one additional species with a known site within the Deschutes National Forest with habitat requirements that match habitats in the LSR.

•Aquatic lichen, *Hydrothyria venosa*, found in clear, cold streams within old-growth forests between 1800-6500 feet (specific location not noted). Known site- Deschutes National Forest, Bend RD. S&M 1/3. Appendix J2-241.

Bryophytes

No surveys for bryophytes have been performed in Davis LSR. Review of the NWFP Appendix J2, which discusses known information on species of concern does not list any known sites in the LSR or the Deschutes National Forest, however, species information on bryophytes in Appendix J2 is incomplete. One species has known sites on the Deschutes NF:

•Liverwort- *Tritomaria exsectiformis* (On shaded moist soil or rocks or rotting wood, especially near springheads). Known sites- Sisters and Bend RDs. S&M 1/2. Appendix J2-94.

A review of bryophyte species listed on Table C-3 in the ROD identifies other species that may have potential habitat in the LSR. Most of these species are associated with riparian areas and/or the mixed conifer wet plant association group.

•Liverwort- *Marsupella emarginata* var. *aquatica* (Stream-side rocks in splash zone middle to higher elevations). Known site- on stream draining Waldo Lake, Willamette NF. S&M 1/2. Appendix J2-89.

•Moss- *Scouleria marginata* (On rocks in splash zones of streams, usually grows mixed with more common *Scouleria aquatica*, just above level of mean summer flows.) Subject to inundation in winter, it needs clean water and cool temperatures. S&M 4. Appendix J2-91.

•Moss- *Thamnobryum neckeroides* (Grows on shaded, moist organic soil and rocks in thickets of willow, vine maple and Sitka alder at middle to higher elevations, occurring at margins of avalanche tracks, seepage areas, and bases of talus slopes, especially in headwall areas.) S&M ?(not on Table 3-C). Appendix J2-92.

Vascular Plants

Surveys for vascular plants have been performed in project areas in the LSR. A review of plant lists from surveys conducted for projects identifies one species on the NWFP Appendix J2 list that has been found in the LSR.

•Sugar stick- *Allotropa virgata* (Occurs in closed-canopy pole, mature, and old-growth seral stages in Douglas fir and true fir in elevations from 250-10,000 feet on inland sites) The plant is not abundant and may not emerge above ground or flower every year. *Allotropa virgata* is an achlorophyllous ericad that has an obligate mycorrhizal relationship with a fungus and vascular plant for establishment and survival. One of the mycobionts may be *Tricholoma magnivelare*, the matsutake mushroom. Large woody debris and long rotations are important to the viability of this plant. It occurs on sites that are associated with past fires. Prescribed fire standards and guidelines may increase its viability over the long-term.

Populations of *Allotropa virgata* are highly isolated and although they are not restricted to old-growth, larger populations are found there. This plant has been observed in 60 year-old stands and stands with trees larger than 11 inches DBH. This plant needs large unfragmented areas to maintain viability and to promote gene exchange due to its small ephemeral seeds and obligate mycorrhizal relationship.

Fire suppression, fragmentation of habitat, and reduction of coarse woody debris are primary factors contributing to the decline of this species. Small patches of LOS forest contribute significantly to the predicted viability due to its limited dispersal capabilities. Fragments may function as corridors to dispersal and gene exchange and are also important to mycobionts. S&M 1/2. Appendix J2-249-252.

Another plant on the Table 3-C list that may have potential habitat in the LSR is:

•Mountain Lady Slipper- *Cypripedium montanum* (Rather broad range of habitats; specific moisture and temperature regimes may be less critical than the presence of specific symbiotic fungi). Known site- Sisters RD. S&M 1/2. Appendix J2-280.

Sensitive Plants

Mimulus jepsonii, Jepson's monkeyflower, occurs in the LSR. Known sites and potenial habitat occur in the relatively flat areas between and around the buttes in lodgepole dry, lodgepole wet, ponderosa pine, and mixed conifer PAGs. Other plants on the R6 Sensitive Plant List with potential habitat in the LSR include: *Agoseris elata*, *Allium campanulatum*, *Castilleja chlorotica*, *Gentiana newberryi*, *Hieracium bolanderi*, *Lobelia dortmanna*, and *Lycopodium complanatum*.

Noxious Weeds

Habitat for noxious weeds is created by ground-disturbing activities. Roadways, harvest units, campgrounds, and trails are readily invaded by noxious weed species with seeds dispersed by vehicles, equipment, humans, and pack animals.

Noxious weed species that are documented in the LSR are knapweeds (*Centaurea maculosa*, *Centaurea diffusa*), St. John's Wort (*Hypericum perforatum*), common toadflax (*Linaria vulgaris*), Scotch Broom (*Cytisus scoparius*), and bull thistle (*Cirsium vulgare*). Noxious weeds found elsewhere on the district with potential to invade the LSR include tansy ragwort (*Senecio jacobaea*), dyer's woad (*Isatis tinctoria*), and dalmation toadflax (*Linaria dalmatica*).

INVERTEBRATE COMPONENT

Mollusks

No surveys of mollusks have been performed in the Davis LSR. Review of NWFP Appendix J2, which discusses known information on species of concern, does not list any known sites or potential habitat in this LSR. Many mollusk species are rare local endemics and are restricted to small geographic areas.

Riparian areas and perennial seeps and springs may be important for localized mollusk populations. Species dependent on springs may have very small populations that are reproductively isolated, much like species living on islands. S&M 1/2. Appendix J2-303-411.

Arthropods

Arthropods are dealt with in the NWFP with general mitigation measures and regional surveys. The arthropods are divided into four groups: 1) Canopy herbivores, 2) Coarse wood chewers, 3) Litter and soil dwelling species, and 4) Understory and forest gap herbivores. There is a significant lack of information on the distribution, taxonomy, and habitat dynamics for species in all these groups. Additional surveys and research are needed to enable managers to more effectively provide for the needs of species in all these groups within the context of ecosystem management. S&M 4. Appendix J2-293-302.

SOIL COMPONENT

The soil component of the Davis LSR is thoroughly documented in the Odell Pilot Watershed Analysis. This documentation includes the determination of the existing and historic soil quality within the LSR. Priorities for restoring soil quality within the LSR are based this analysis and its methodologies.

WATERSHED ANALYSIS COMPONENT

In addition to the references already made to the 1994 Odell Pilot Watershed Analysis, the Landscape Areas from that analysis were used to set the overall physical, biological, and social context of the LSR. However, a portion of the Davis LSR is located outside of the boundaries of the Odell Watershed including Ringo Butte, most of Royce Mountain, Davis Mountain, and Hamner Butte.

After reviewing the landscape trends, goals, objectives and opportunities documented for the "Central Conifer Association" Landscape Area in the Odell WA, it was decided that the Central Conifer Association should be expanded to include these portions of the LSR. The goals, objectives, and opportunities for each landscape area were then used to assist in the delineation of the Management Strategy Areas. (See Figures 2-18 and 2-19)

In addition to this information, the Odell WA also provides a majority of the social context for this LSR. A map of the watershed illustrates how the social context appears on the landscape. Documentation in the Odell WA thoroughly describes the LSR in terms of social expectations; human settlements influencing the LSR; the history of Forest Service management within the LSR; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

FOREST PLAN AND ACCESS COMPONENT

The Management Areas from the Deschutes National Forest Land and Resource Management Plan were utilized to determine existing management objectives and standards and guidelines. (See Figure 2-20) The 1995-1996 Crescent Ranger District Travel and Access Map was used to determine access restrictions and allowable uses. A map of the open and closed roads within the LSR was also created. (Figure 2-21)

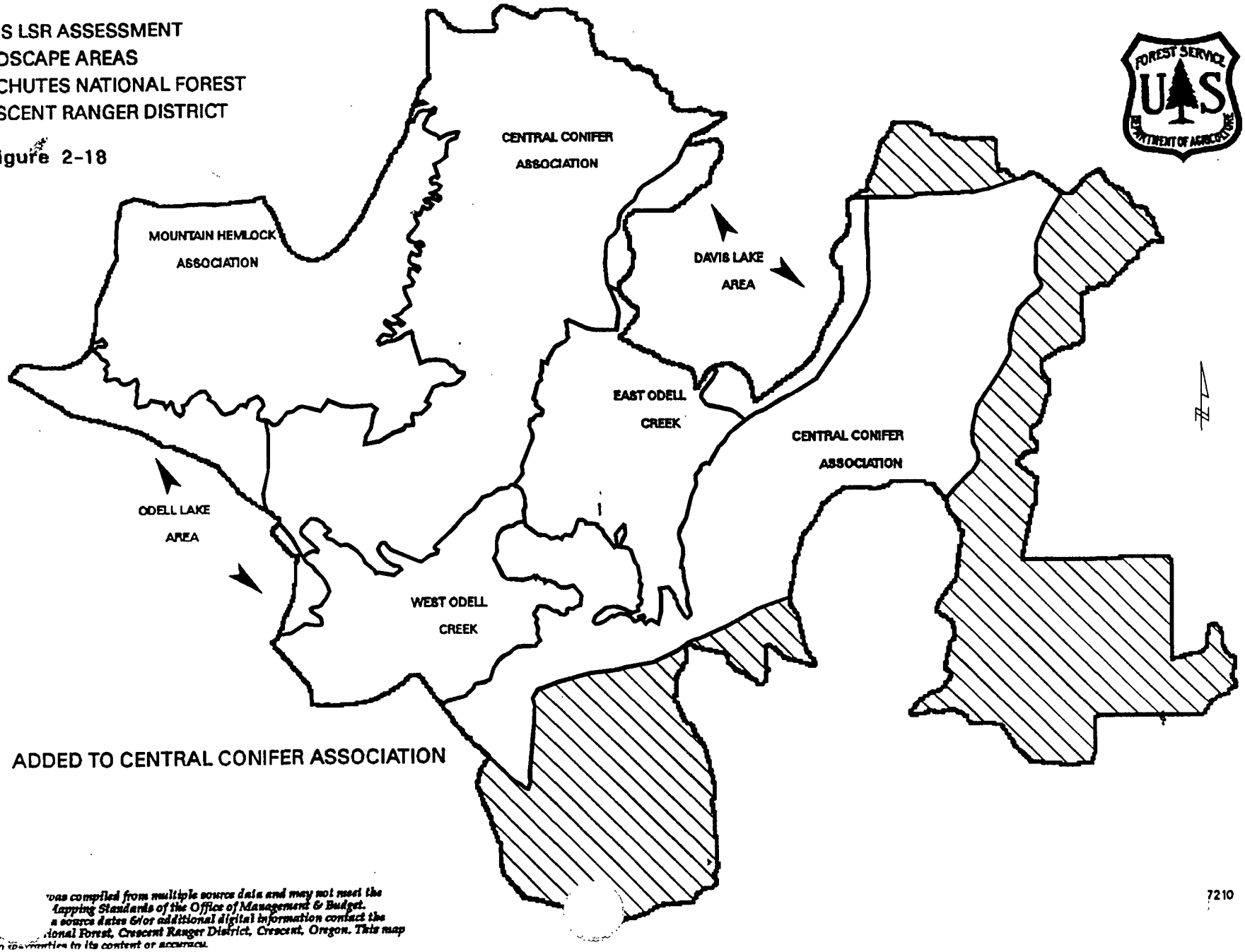
MANAGEMENT STRATEGY AREA BASE MAP (MSAs)

The Management Strategy Area Base Map represents the answers to both of the key questions developed for the Davis LSR Assessment. This base map delineates specific areas within the Davis LSR where management objectives and criteria for the protection and enhancement of late successional and old

growth related species will be developed for the short and long-term. Consequently, all of the objectives and management options are related to a spatial and temporal scale. (See Figure 2-22)

DAVIS LSR ASSESSMENT
LANDSCAPE AREAS
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 2-18



Origi[illegible]was compiled from multiple source data and may not meet the U.S. [illegible]Mapping Standards of the Office of Management & Budget. For s[illegible]e source dates &/or additional digital information contact the Desc[illegible]ional Forest, Crescent Ranger District, Crescent, Oregon. This map has no warranties to its content or accuracy.

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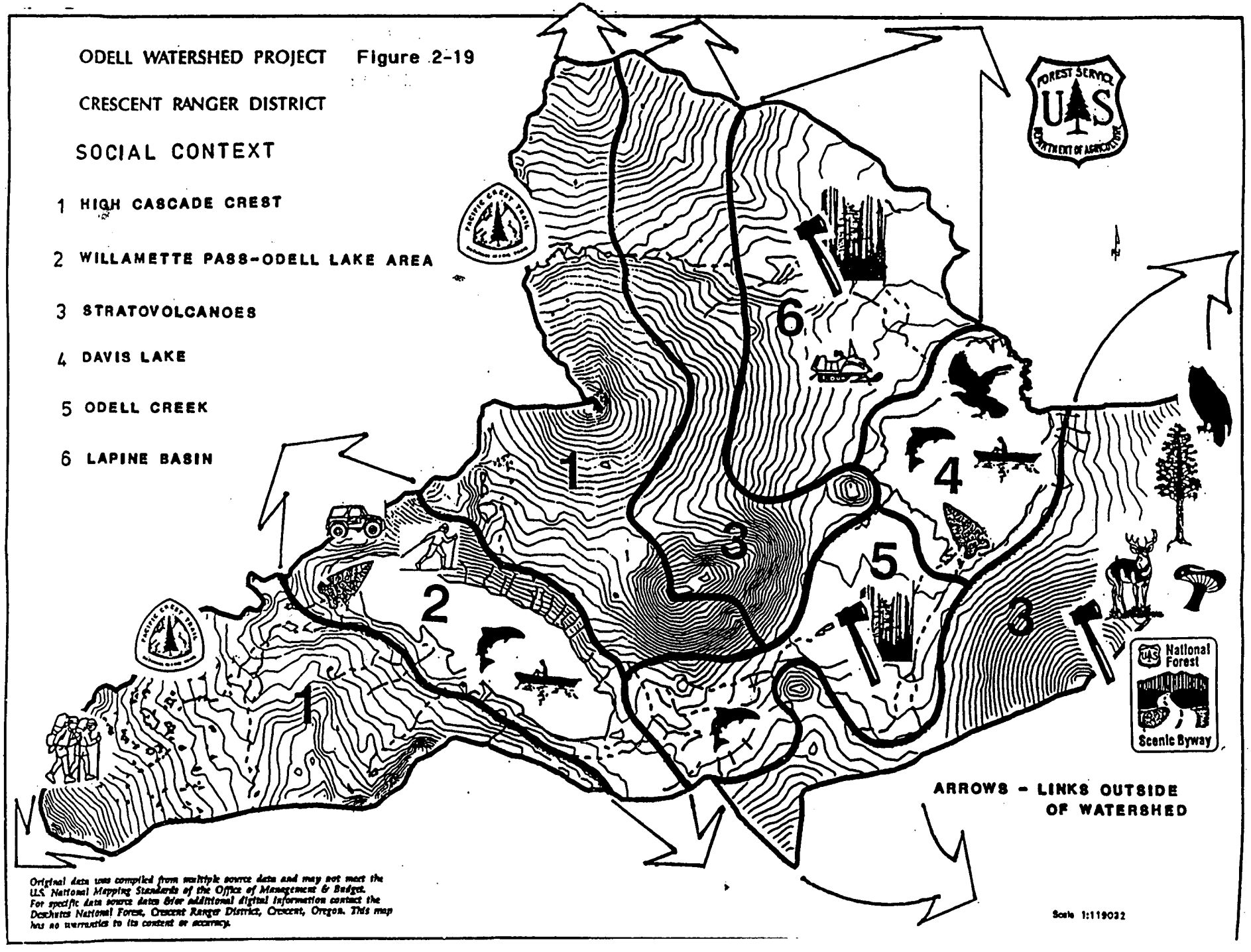
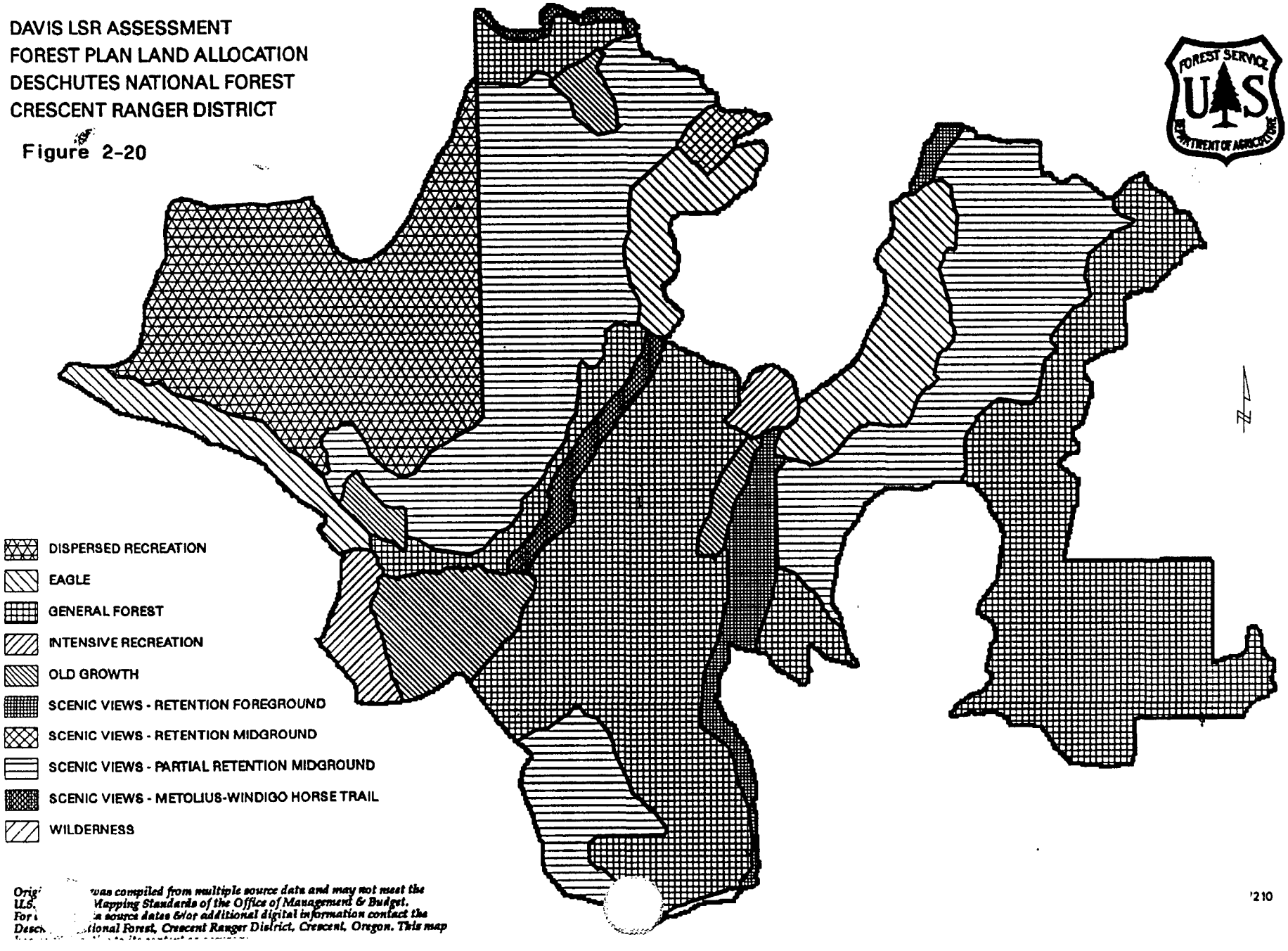

ODELL WATERSHED PROJECT Figure 2-19
CRESCENT RANGER DISTRICT
SOCIAL CONTEXT
1 HIGH CASCADE CREST
2 WILLAMETTE PASS-ODELL LAKE AREA
3 STRATOVOLCANOES
4 DAVIS LAKE
5 ODELL CREEK
6 LAPINE BASIN
FOREST SERVICE
U S
DEPARTMENT OF AGRICULTURE
National Forest
Scenic Byway
ARROWS - LINKS OUTSIDE OF WATERSHED
Original data was compiled from multiple source data and may not meet the U.S. National Mapping Standards of the Office of Management & Budget. For specific data source data &/or additional digital information contact the Deschutes National Forest, Crescent Ranger District, Crescent, Oregon. This map has no warranties to its content or accuracy.
Scale 1:119032

DAVIS LSR ASSESSMENT
FOREST PLAN LAND ALLOCATION
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 2-20



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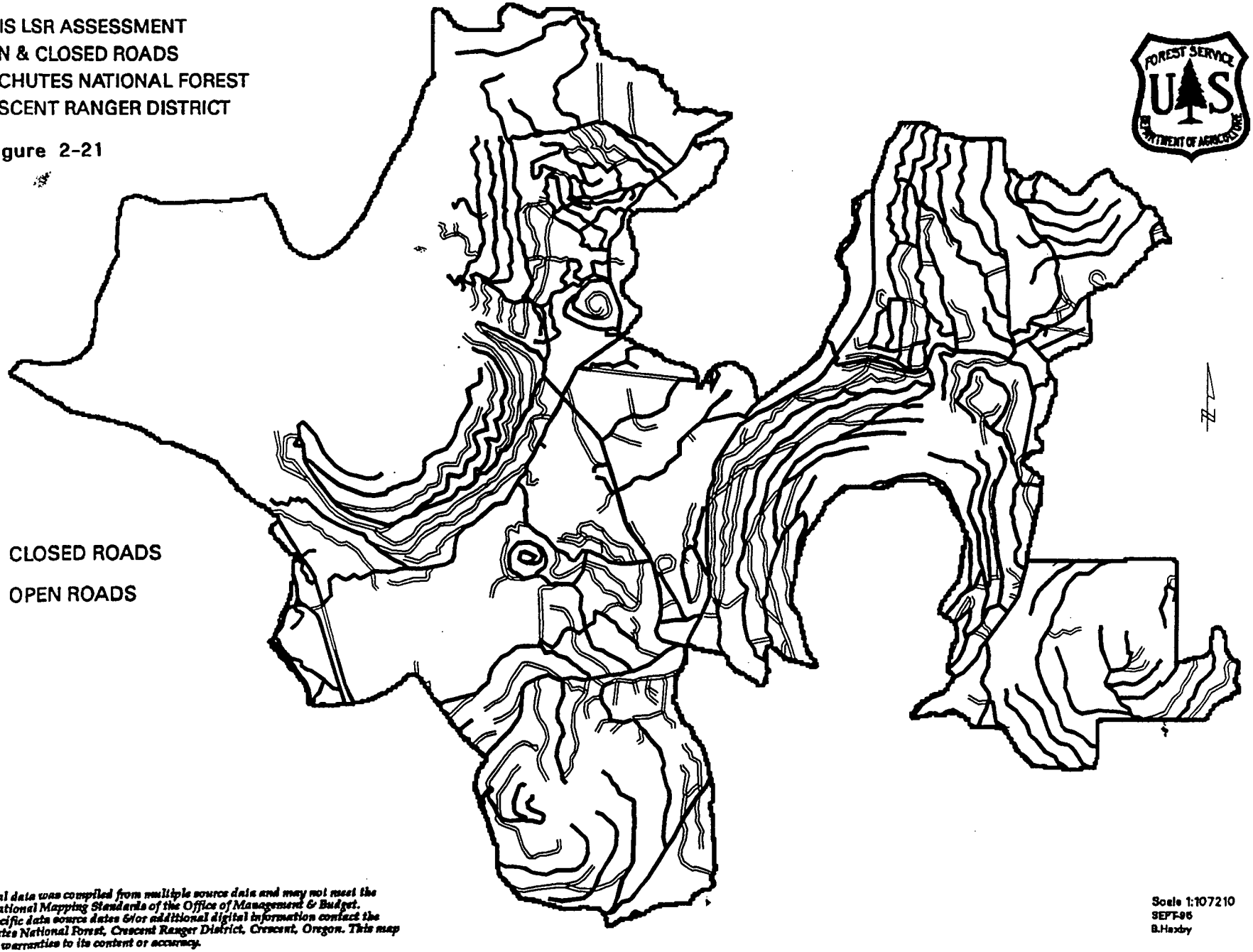
DAVIS LSR ASSESSMENT
OPEN & CLOSED ROADS
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 2-21



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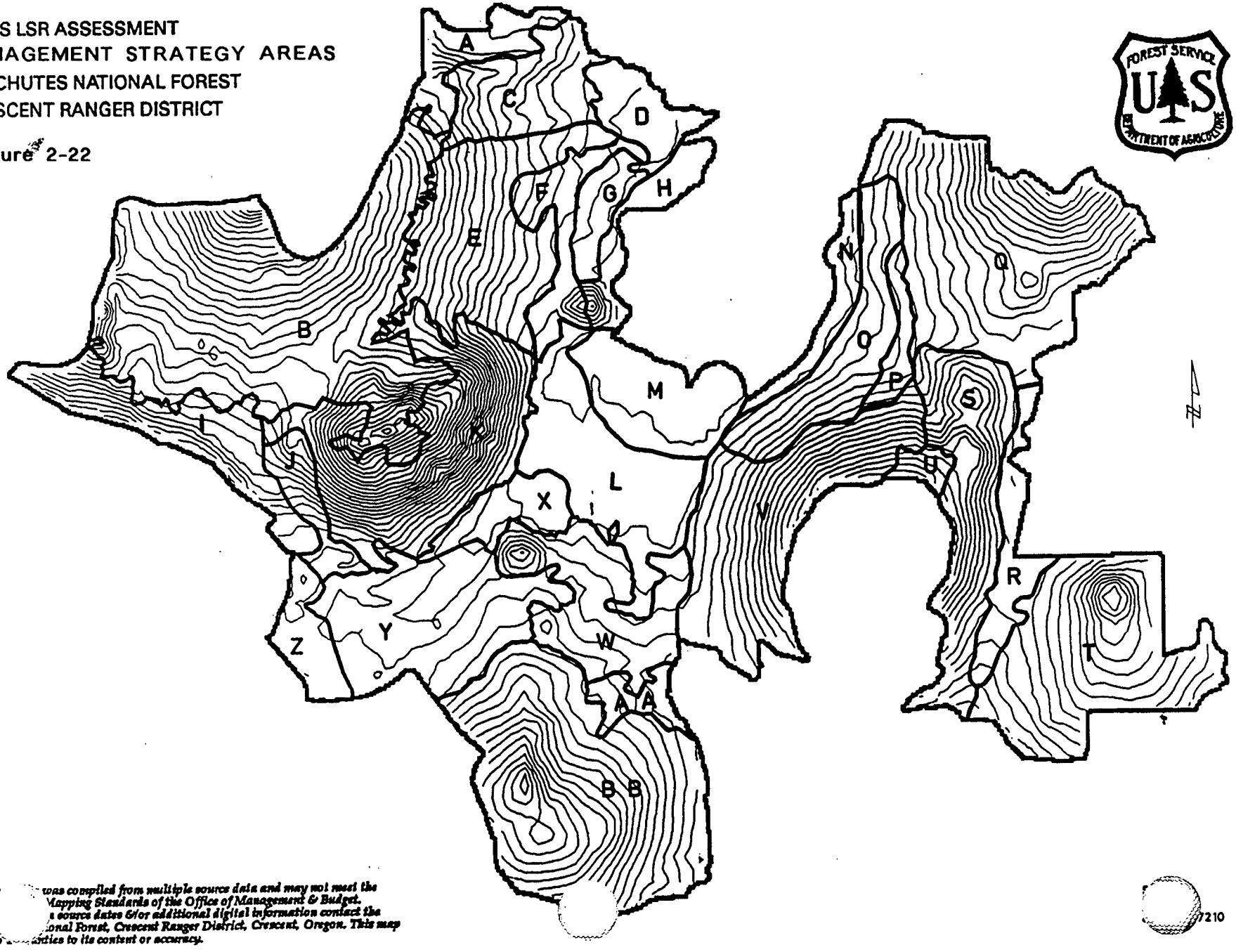
DAVIS LSR ASSESSMENT
MANAGEMENT STRATEGY AREAS
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 2-22



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CHAPTER 3

MANAGEMENT STRATEGY OVERVIEW

DAVIS LSR MANAGEMENT STRATEGY OVERVIEW

This chapter is intended to be an overview of the management strategies developed to protect and enhance the Davis LSR. These strategies range from identifying the desired levels of snags and large woody debris to reducing the risk of catastrophic loss of late and old structured (LOS) forest within the LSR. Where appropriate, priorities for management activities and appropriate scales and schedules are recommended. The next chapter provides more specific information and management recommendations for each individual Management Strategy Area (MSA).

The management strategy for the Davis LSR is designed to protect and enhance a composition of six types of late-successional forest habitats across the landscape. These six areas were previously described in Chapter 2 as "Areas with a common habitat type and function". (See Figure 3-1). Emphasis/indicator species such as the northern spotted owl were selected for each of the six areas and their habitat needs were quantified to help characterize the desired late-successional conditions. The six areas include:

- ☐ **Mixed conifer for northern spotted owl**
  54% of the Davis LSR

- ☐ **Mixed conifer for bald eagle**
  8% of the Davis LSR

- ☐ **Mixed conifer/lodgepole with dual connectivity function**
  3% of the Davis LSR

- ☐ **Mixed conifer/lodgepole/ponderosa for great gray owl and/or bald eagle**
  6% of the Davis LSR

- ☐ **Lodgepole with/without riparian for black-backed woodpecker and/or riparian habitat**
  16% of the Davis LSR

- ☐ **Mountain hemlock for wolverine and black-backed woodpecker**
  13% of the Davis LSR.

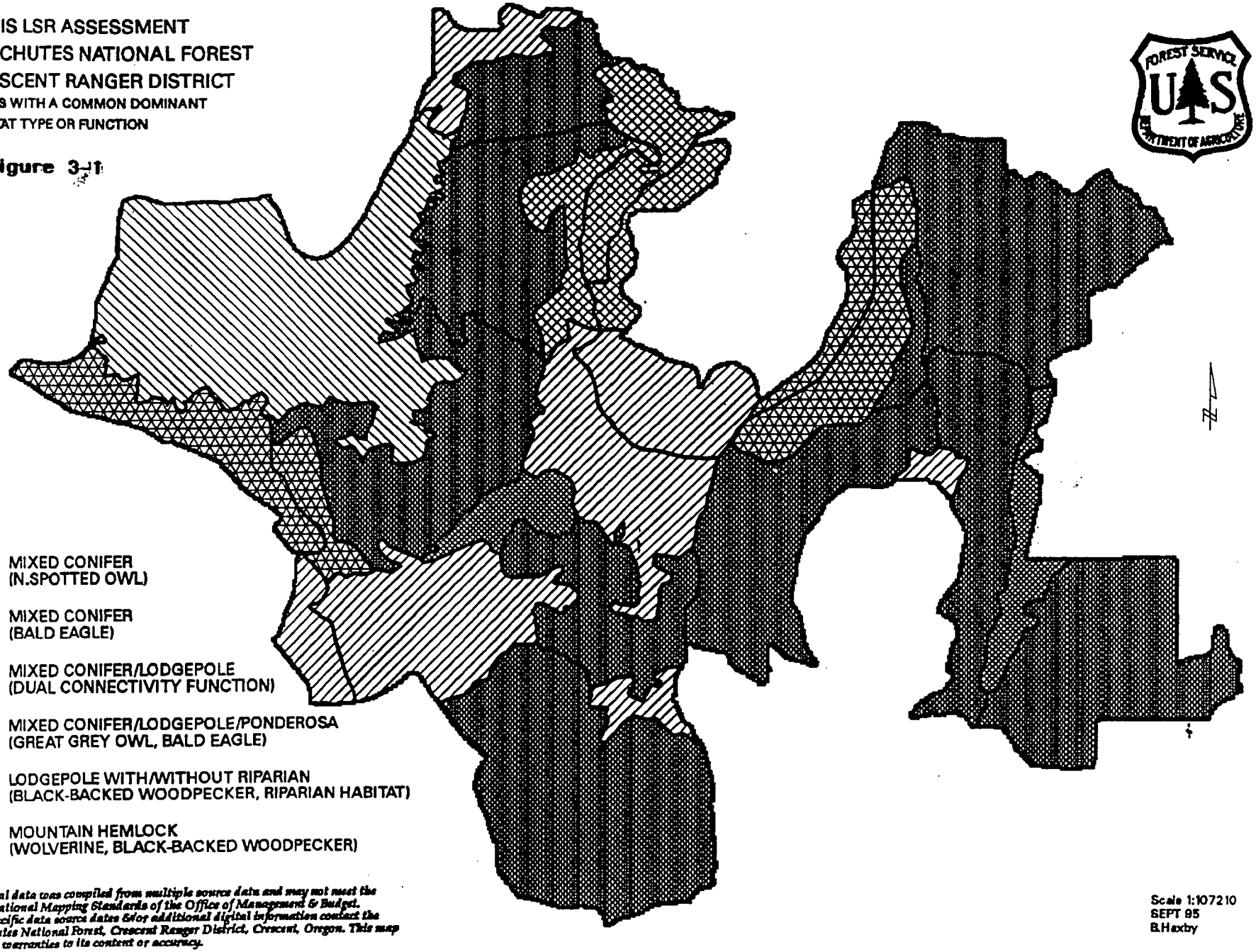
Area Descriptions:

Mixed conifer for northern spotted owl - This area encompasses approximately 26,310 acres of the Davis LSR. It is comprised of areas that currently function as nesting, roosting and foraging habitat for the northern spotted owl and provide habitat for other old growth related species with similar habitat needs. The eight known owl activity centers in the LSR and their respective home range habitats are included in these areas. Mixed conifer wet and dry plant association groups (PAGs) occupy the majority of the area. The desired condition for this mixed conifer area is to provide climatic-climax habitat versus a fire-climax condition. It is recognized that this climatic-climax condition may leave the desired components of habitat at high risk or imminently susceptible to insect attack and/or wildfire on the eastside of the Cascades. The overall management strategy for this area is to reduce the imminent susceptibility of habitat loss while maintaining the highest quantity and quality of climatic-climax habitat as possible in the short and long-term. MSAs in this strategy include: C, E, K, P, Q, S, T, V, W, and BB.

Mixed conifer for bald eagle - This area encompasses approximately 4,139 acres of the Davis LSR. The area primarily consists of stands in the mixed conifer dry PAG that are proximate to either Davis or Odell Lake. This area currently provides habitat for the bald eagle and dispersal habitat for the northern spotted owl in key connectivity corridors. The overall management strategy for this area is focused on sustaining and enhancing a large tree component to accommodate the bald eagle in the short and long-term. The

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
AREAS WITH A COMMON DOMINANT
HABITAT TYPE OR FUNCTION

Figure 3-1



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SEPT 95
B.Haxby

stands near Davis Lake will move toward a fire-climax type habitat to retain and enhance the large tree component and help reduce the risk of a catastrophic event in the LSR. Stands near Odell Lake are capable of sustaining a greater density of trees and should continue to provide some nesting, roosting, and foraging habitat for the northern spotted owl while providing optimal bald eagle habitat. MSAs in this strategy include: I, J, N, and O.

Mixed conifer/lodgepole with dual connectivity function - These areas encompass only 1,427 acres of the Davis LSR. They are mostly comprised of the lodgepole PAG and connect other large patches of late and old-structured suitable lodgepole habitat within the Davis LSR. The location and physiographic features of these areas also make them an important link for connecting existing spotted owl activity centers. Although these areas are not capable of providing nesting, roosting, or foraging habitat, the strategy is to manage these stands to provide dispersal habitat for the northern spotted owl and suitable LOS lodgepole habitat. MSAs in this strategy are X and R.

Mixed conifer/lodgepole/ponderosa for great gray owl and/or bald eagle - This area encompasses approximately 2,608 acres of the Davis LSR and includes several plant association groups. The close proximity to Davis Lake and Moore Creek creates an opportunity to manage this area for a variety of late-successional habitats over time. The overall management strategy is to sustain and enhance large trees to accommodate the bald eagle in the short and long-term. The stands in this area will move toward a fire-climax habitat as the large tree component is retained and enhanced and will help reduce the risk of a catastrophic event in the LSR. The desired fire-climax condition will provide habitat for a variety of species including the flammulated owl and white-headed woodpecker. Habitat components believed to be important to the great gray owl, e.g. meadows, will also be retained within the area. MSAs in this strategy include: D, F, G, and H.

Lodgepole with/without riparian for black-backed woodpecker and/or riparian habitat - This area encompasses approximately 7,913 acres and delineates the LaPine Basin within the Davis LSR. This basin is dominated by lodgepole pine PAGs and bisects the mixed conifer stands and spotted owl habitat within the LSR. The overall strategy for this area is to provide large contiguous blocks of mature and overmature lodgepole for the black-backed woodpecker and marten throughout the short and long-term. Large blocks (1000+ acres) of late and old structured lodgepole will be rotated throughout the area to sustain an area of old growth over time and reduce the risk of a castastrophic fire in the LSR. In areas where the fire hazard is inherently low due to high water tables (MSA - Y), management will focus primarily on monitoring and enhancement activities such as meadow maintenance. MSAs in this strategy include: A, L, M, U, Y, Z and AA.

Mountain hemlock for wolverine and black-backed woodpecker - This roadless area encompasses about 6,492 acres of the Davis LSR and is characterized by the mountain hemlock and lodgepole high elevation PAGs. The vegetation within this area is believed to be within its historic range of variability and is not highly susceptible to catastrophic loss of existing structure or character due to insects or wildfire. The overall management strategy for this area can be best described as "hands off". At this time the existing condition is consistent with the desired condition. Management will focus on enhancement activities such as the planting of blister rust resistant white pine in existing root rot pockets. MSA - B delineates this entire area.

DESIRED LATE SUCCESSIONAL CONDITIONS

The intent of the following section is to: (1) provide a quantitative overview of the LSR in terms of how much suitable habitat for the selected late-successional and old-growth related species is sustainable within the plant association groups; (2) provide a quantitative description of the desired suitable habitats

for the emphasis late-successional related species by PAG; and (3) document the motivation, thought processes, and criteria utilized to develop these descriptions.

OVERALL DESIRED LSR CONDITIONS

Although it has been recognized for some time that forest conditions east of the Cascades are more susceptible to catastrophic fire and insect and disease infestation than westside forests, the reality of how these differences would affect the management of the Davis and other LSRs on the Deschutes National Forest was not fully realized until the spring of 1996. As various LSR and project implementation teams across the Deschutes National Forest began comparing suitable habitat conditions with stand conditions that silviculturists, entomologists, and pathologists consider sustainable, the determination was made that suitable habitat is not sustainable in most of the eastside ecosystems.

This determination made it clear that a strategy was needed to determine how LSRs on the Deschutes National Forest could be managed to retain both suitable and sustainable habitat conditions on a temporal and spatial scale. A Science Team was established to develop a scientifically credible strategy to address the issue. Documents detailing the processes, research, and products of the Science Team are included in the Appendix. The following summarizes the findings of the Science Team that affect the management strategies for the Davis LSR.

To quantify and define "sustainable habitat", the Science Team developed criteria to classify forest stands as imminently susceptible to insect attack or wildfire. **Imminently susceptible** is defined as a situation where the conditions are such that it is very likely there will be significant change in structure or character of forest stands on a large scale as a result of insect attack and/or fire within the next 10 years. Changes that would result in catastrophic loss of existing late and old-structured components within the LSR were the primary concern of the LSR team.

The **upper management zone (UMZ)** for a given plant association group represents the point at which tree mortality begins to occur due to competition for site resources. The UMZ is the site-specific density level of trees at which a suppressed class of trees develops (Cochran et al 1994). This density level, which varies by PAG, also identifies the point at which pine-associated bark beetles and other density-related pests can develop to epidemic levels. The non-density related pests also benefit from stands above the UMZ in that they have considerable opportunity to become established in the stands especially when periodic droughts occur.

The upper management zones established for the various PAGs within the Davis LSR were used along with fuel profiles to determine "sustainable habitat". Therefore, only forest stands with a density level equal to or below the UMZ established for each PAG ($\leq$ 100% UMZ) are considered to be sustainable in the long-term. The UMZ and fuel profiles were chosen as indicators of risk because bark beetle epidemics and high intensity wildfires are the most common causes of significant and unexpected large tree mortality.

The difference between what is believed to be "sustainable habitat" versus what is currently functioning as "suitable habitat" within the Davis LSR is illustrated by the example below. This table displays Basal Areas (BA) and Trees Per Acre (TPA) for an existing late and old-structured mixed conifer dry stand within the Davis LSR. Values in the first column indicate suitable habitat conditions for the northern spotted owl (nesting, roosting, and foraging habitat). Values in the second column indicate sustainable habitat as defined by stand density indexes and upper management zones (Cochran et al 1994).

SUITABLE HABITAT	SUSTAINABLE HABITAT (100% UMZ)
BA = 169 Range (135-203)	BA = 120 Range (115-128)
TPA = 345 Range (276-414)	TPA = 90 Range (40-175)

The differences between "suitable habitat" and "sustainable habitat" challenged the Science Team to determine an appropriate balance of vegetative conditions that would allow the LSR to function as intended and be sustainable in the short and long-term. The following considerations were factored into quantifying the desired balance:

- -- Habitat thresholds for LOS associated species;
- -- Context of the LSR within the surrounding landscape and management allocations;
- -- Upper management zones;
- -- Historical Range of Variability (HRV); and
- -- Cycling structural stages to provide suitable habitats throughout time.

The table below is one of the final products developed by the Science Team. The table displays a balance of three vegetative conditions including an effective proportion of both "suitable" and "sustainable" habitats. The third vegetative condition represents a "transitional" stage in which forest stands do not contain the desired "suitable" and/or "sustainable" habitat conditions. Stands in this condition could have tree densities above the upper managment zone (>100% UMZ) and/or structural components that do not provide suitable habitat.

Table 3 - 1, Desired Late Successional Reserve Condition

PAG	Suitable Habitat % Climatic	Suitable Habitat % Fire	% ≥ UMZ but < Suitable Habitat	% < UMZ
MH	70 (40-70)	N/A	15 (0-30)	15 (0-30)
MCW	60 (51-69)	N/A	10 (0-20)	30 (20-40)
MCD	40 (30-50)	10 (5-10)	25 (20-30)	25 (20-30)
PPW/PPD	5 (0-10)	55 (40-70)	20 (10-30)	20 (10-30)
LPW/LPD	50 (30-70)	N/A	10 (0-20)	40 (20-60)

MH - Mountain Hemlock; MCW - Mixed Conifer Wet; MCD - Mixed Conifer Dry; PPW/PPD - Ponderosa Wet and Dry; LPW/LPD - Lodgepole Wet and Dry

This quantitative description of the overall desired condition for the LSR serves several important functions. First, it sets clear and measurable objectives for future management of Davis LSR as a whole. Secondly, it provides project planning teams a means to evaluate the existing condition of the LSR in relationship to the desired condition. This allows teams to prioritize management activities within the LSR.

This table also provides baseline data to evaluate and monitor how effectively future projects move the LSR toward the desired condition. This baseline can also facilitate an evaluation and comparison of LSR conditions across the Deschutes National Forest.

The manner in which the desired balance of vegetative conditions (Table 3-1) is spatially distributed throughout Davis LSR over time is best illustrated by the six areas described at the beginning this chapter (p. 3-1). Areas designated within the LSR to provide "mixed conifer for northern spotted owl" will retain the appropriate percentage of climatic-climax suitable habitat in the mixed conifer dry and wet PAGs. Areas designated to provide "mixed conifer for bald eagle" or "mixed conifer/lodgepole/ ponderosa for great gray owl and/or bald eagle" will be managed to provide the balance of fire-climax suitable habitat in the mixed conifer dry and ponderosa pine PAGs.

Areas designated as "Lodgepole with/without riparian for black-backed wood pecker and/or riparian habitat" or "Mixed conifer/lodgepole with dual connectivity function" will be managed to attain the desired balance of vegetative conditions within the lodgepole pine wet and dry PAGs. The area designated as "Mountain hemlock for wolverine and black-backed woodpecker", will continue to provide a balance of conditions as quantified for the mountain hemlock PAG.

Over time, the desired percentages of each PAG in the "sustainable" or "transitional" conditions will shift spatially throughout the LSR based on the existing conditions of vegetation and the associated habitats. The twenty-eight Management Strategy Areas (MSAs) described in Chapters 2 and 4 delineate the diversity of existing conditions within the LSR. Chapter 4 provides detailed descriptions of the existing conditions within each MSA and identifies when and where changes in the existing conditions are appropriate in the short and/or long-term.

SUITABLE HABITAT DESCRIPTIONS BY PAGS AND EMPHASIS SPECIES

The tables below describe and quantify "suitable habitat" as referenced above in Table 3-1. These descriptions are organized by plant association groups and the associated emphasis/indicator species. These suitable habitat conditions were based on peer-reviewed literature most appropriate for eastside habitat conditions and research conducted on existing habitats within the Deschutes National Forest. Data collected from forest stands within the Davis LSR that currently function as nesting, roosting, and foraging habitat for the northern spotted owl was also used to quantify suitable climatic-climax habitat with the mixed conifer dry PAG. Refer to the Appendix for references and additional information.

The suitable habitat conditions characterized in the following tables should be used to determine appropriate silvicultural treatments and prescribe appropriate levels of snags and down wood throughout the Davis LSR. As previously mentioned, the 28 MSAs described in Chapter 4 delineate the desired locations for these conditions within the Davis LSR. The six areas previously described by PAG and emphasis species such as "mixed conifer for the northern spotted owl" provide a conceptual picture of how these habitats should be distributed across the LSR.

Table 3 - 2

Suitable Habitat Condition by Plant Association Group

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft³/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
MH (Climatic)	25 - 40 tons/ac. or 2700 - 4300 ft³/ac.			TPA	275 (220-330)	80 (64 - 96)	80 (64 - 96)	17 (14 - 20)	24 (19 - 29)	24 (19 - 29)	25 (20 - 30)	25 (20 - 30)	AM - Within PAG retain ≥ 50% of forest stand in mature/old growth for linkage, blocks of mature/old growth must be linked to provide connectivity.
	Snags: 85% > 21" dbh (ex. 6-15/ac), 15% 15-21" dbh (ex. 2-3/ac)			BA	433 (346-520)	4 (3 - 5)	21 (17 - 25)	13 (10 - 16)	42 (34 - 50)	69 (55 - 76)	107 (86 - 128)	177 (142 - 212)	Tree Species: PIMO - Blister rust ABMAS - Heartrot
Indicators: AM, BO	Logs: 100% > 31" dia. and 33' long (ex. 7-24/ac)	ave 70%	2 - 3	Stand SDI	620 (411 - 744)	10 (10 - 16)	43 (37 - 56)	23 (18 - 26)	66 (46 - 70)	101 (67 - 102)	148 (95 - 142)	234 (138 - 208)	

INDICATOR SPECIES

AM	= American Marten
BO	= Boreal Owl
PWP	= Pileated Woodpecker
NSO	= Northern Spotted Owl
BE	= Bald Eagle
FO	= Flammulated Owl
BBWP	= Black-backed Woodpecker
GGO	= Great Gray Owl
NG	= Northern Goshawk

TREE SPECIES

PIMO	= Western White Pine
ABMAS	= Shasta Red Fir
PIPO	= Ponderosa Pine
PSME	= Douglas-Fir
TSME	= Mountain Hemlock
TABR	= Pacific Yew
PILA	= Sugar Pine
LAOC	= Western Larch
CADE3	= Incense Cedar
PICO	= Lodgepole Pine
PIEN	= Englemann Spruce

PLANT ASSOCIATION GROUPS (PAG'S)

MH	= Mountain Hemlock
MCW	= Mixed Conifer Wet
MCD	= Mixed Conifer Dry
PPW	= Ponderosa Pine Wet
PPD	= Ponderosa Pine Dry
LPD	= Lodgepole Dry
LPW	= Lodgepole Wet

Table 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft³/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
MCW (Climatic) Indicators: PWP, NSO	25 - 35 tons/ac. or 2200 - 3100 ft³/ac. Snags: 60% 9-16" dbh (ex. 9-17/ac), 20% 16-25 dbh (ex. 1-2/ac), 20% >25"dbh (ex. 1-2/ac) Logs : 60% 16-25" dia. (ex. 7-16/ac), 40% >25" dia. (ex. 3-6/ac)	> 70%	2 - 3	TPA	357	150	70	70	30	15	12	10	PWP - Roosts stands of white fir with > 4 TPA >20" live or dead. NSO - ≥ 40% of white fir understory > 8" dbh. Tree Species: PIPO and PSME - Large Tree component LOAC, TSME, TABR - Species diversity
					(284 - 430)	(120 - 180)	(56 - 84)	(56 - 84)	(24 - 36)	(12 - 18)	(9 - 15)	(7 - 13)	
				BA	270	7	19	55	53	14	51	71	
					(263 - 324)	(6 - 8)	(15 - 23)	(44 - 66)	(42 - 64)	(11 - 17)	(41 - 61)	(57 - 85)	
				Stand SDI	476	18	37	97	85	66	74	≥ 78	
					(365 - 581)	(14 - 21)	(30 - 45)	(77 - 116)	(68 - 102)	(52 - 79)	(56 - 93)	(68 - 125)	

INDICATOR SPECIES

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LPW	= Lodgepole Wet

Table 3 - 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
MCD (Climatic) Indicators: PWP, GGO, NG, BE, FO, BBWP,NSO	12 - 24 tons/ac. or 1100 - 2100 ft³/ac. **Snags:** 70% 12-20" dbh (ex. 3-9/ac), 30% > 20" dbh (ex. .75-2/ac) **Logs:** 100% > 15" dia. (ex. 5-14/ac)	ave 70%	2 - 3	TPA	345 (276 - 414)	200 (160 - 240)	74 (59 - 89)	35 (28 - 42)	16 (13 - 19)	10 (8 - 12)	6 (5 - 7)	4 (3 - 5)	PWP - Roosts stands of white fir with > 4 TPA >20" live or dead. NSO - >40% white fir understory>8"dbh..Large trees with cavities for nesting. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. BE - Insure large ponderosa pine and Douglas fir trees of the super canopy provide an open flight path from tree. Maintain large trees, especially snags along riparian edges that provide panoramic views and open exposure on at least one side. BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. Tree Species: PIPO, PSME - Large tree component PILA, LAOC, CADE3, TABR, ABMAS - species diversity
				BA	169 (135 - 203)	10 (8 - 12)	20 (16 - 24)	28 (22 - 34)	28 (22 - 34)	29 (23 - 35)	26 (21 - 31)	28 (22 - 34)	
				Stand SDI (PSME)	251 (201 - 301)	33 (26 - 40)	43 (34 - 52)	46 (28 - 63)	39 (13 - 65)	35 (28 - 42)	28 (22 - 34)	27 (22 - 32)	
MCD (Fire) Indicators: BE, WHWP, FO	**Snags:** BE 1-2 > 25" WHWP,FO 1-5 > 25" **Logs:** BE 1-2 > 25" WHWP,FO 1-5 > 25"	30-50%	≥ 1	TPA	35+ ± 20% (23 - 42)	0-80 ± 50% (0 - 120)	0-50 ± 50% (0- 75)	0-35 ± 50% (0- 52)	10 ± 50% (5 - 15)	7 ± 50% (3 - 11)	11 ± 20% (9 - 13)	7 ± 20% (6 - 8)	
				BA	144 (115 - 173)	10 total (5 - 15)			18 (9 - 27))	20 (10 - 30)	47 (38 - 56)	49 (39 - 59)	
				Stand SDI	195+ (141 - 373)	x (0 - 14)	x (0 - 40)	x (0 - 72)	28 (14 -42)	31 (13 - 48)	68 (56 - 80)	68 (58 - 77)	

Table 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
PPW (Climatic)	12 - 24 tons/ac. or 500 - 2200 ft³/ac.			TPA	187	40	40	40	20	17	20	10	WHWP - Old growth should be maintain at > 37% over the PAG.
	Snags: 50% 18-28" dbh (ex. .5-3/ac)				(150 - 224)	(32 - 48)	(32 - 48)	(32 - 48)	(16 - 24)	(14 - 20)	(16 - 24)	(8 - 12)	Tree Species:
Indicators: FO, WHWP	50% > 28" dbh (ex. .25-1.5/ac)	> 40%	≥ 1	BA	285	2	11	31	35	49	86	71	PIPO - Large tree component
	Logs: 100% > 20" dia. (ex. 1-9/ac)				(228 - 342)	(1 - 3)	(9 - 13)	(25 - 37)	(28 - 42)	(39 - 59)	(69 - 103)	(57 - 85)	PICO - species diversity
				Stand SDI	433	5	21	55	57	74	124	≥ 78	
					(347 - 535)	(4 - 6)	(17 - 25)	(44 - 66)	(45 - 68)	(61 - 105)	(99 - 148)	(77 - 116)	
PPW (Fire)	Snags: BE 1-2 > 25" WHWP,FO 1-5 > 25"			TPA	35+ ± 20%	0-80 ± 50%	0-50 ± 50%	0-35 ± 50%	10 ± 50%	7 ± 50%	11 ± 20 %	7 ± 20%	
				BA	144	10 total			18	20	47	49	
Indicators: BE, WHWP, FO	Logs: BE 1-2 > 25" WHWP,FO 1-5 > 25"	30 - 50%	≥ 1		(115 - 173)	(5 - 15)			(9 - 27)	(10 - 30)	(38 - 56)	(39 - 59)	
				Stand SDI	195+	x	x	x	28	31	68	68	
					(141 - 373)	(0 - 14)	(0 - 40)	(0 - 72)	(14 - 42)	(13 - 48)	(56 - 80)	(58 - 77)	

INDICATOR SPECIES

AM	= American Marten
BO	= Boreal Owl
PWP	= Pileated Woodpecker
NSO	= Northern Spotted Owl
BE	= Bald Eagle
FO	= Flammulated Owl
BBWP	= Black-backed Woodpecker
GGO	= Great Gray Owl
NG	= Northern Goshawk

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PIMO	= Western White Pine
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TABR	= Pacific Yew
PILA	= Sugar Pine
LAOC	= Western Larch
CADE3	= Incense Cedar
PICO	= Lodgepole Pine
PIEN	= Englemann Spruce

PLANT ASSOCIATION GROUPS (PAG'S)

MH	= Mountain Hemlock
MCW	= Mixed Conifer Wet
MCD	= Mixed Conifer Dry
PPW	= Ponderosa Pine Wet
PPD	= Ponderosa Pine Dry
LPD	= Lodgepole Dry
LPW	= Lodgepole Wet

Table 3 - 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
PPD (Climatic) Indicators: WHWP, NG	10-15 tons/ac. or 900 - 1300 ft²/ac. Snags: 15% 10-12"dbh (ex. 2.5-5/ac), 30% 12-20"dbh (ex. 1-2.5/ac), 25% 20-31"dbh (es. .25-.75/ac) 30% > 31" dbh (ex. .25-.5/ac) Logs: 100% >20" dia. (ex. 7-15/ac)	ave 40%	≥ 1	TPA	180 (144 - 216)	40 (32 - 48)	40 (32 - 48)	40 (32 - 48)	20 (16 - 24)	15 (12 - 18)	15 (12 - 18)	10 (8 - 12)	WHWP - Old growth should be maintain at > 37% over the PAG. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. Tree Species: PIPO - Large tree component PICO - Species diversity
				BA	232 (186 - 278)	2 (1 - 3)	11 (9 - 13)	31 (25 - 37)	35 (28 - 42)	18 (14 - 22)	64 (51 - 77)	71 (57 - 85)	
				Stand SDI	394 (313 - 472)	5 (4 - 6)	21 (17 - 26)	55 (44 - 66)	57 (45 - 68)	66 (52 - 79)	93 (74 - 111)	≥ 78 (77 - 116)	
PPD (Fire) Indicators: BE, WHWP, FO	Snags: BE 1-2 > 25" WHWP,FO 1-5 > 25" Logs: BE 1-2 > 25" WHWP,FO 1-5 > 25"	30 -50%	≥ 1	TPA (8 - 273)	35+ ± 20%	0-80 ± 50% (0 - 120)	0-50 ± 50% (0 - 75)	0-35 ± 50% (0 - 52)	10 ± 50% (5 - 15)	7 ± 50% (3 - 11)	11 ± 50% (6 - 11)	7 ± 50% (4 - 11)	
				BA	144 (115 - 173)	10 total (5 - 15)			18 (9 - 27)	20 (10 - 30)	47 (24 - 71)	49 (25 - 74)	
				Stand SDI	195+ (27 - 216)	x (0 - 14)	x (0 - 40)	x (0 - 72)	28 (14 - 42)	31 (13 - 48)	68 (34 - 102)	68 (34 - 102)	

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Table 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
LPW (Climatic)	12 - 24 tons/ac. or 1000 - 2150 ft³/ac.	ave 60%	≥ 1	TPA	370 (296 - 444)	150 (120 - 180)	120 (96 - 144)	70 (56 - 84)	20 (16 - 24)	10 (8 - 12)			BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting.
Indicators: BBWP, GGO, NG	Snags: 50% 11-20" dbh (ex. 3-8.5/ac) 50% > 20" dbh (ex. 1-3.5/ac) Logs: 50% 11-15" dia. (ex. 13-43/ac) 50% > 15" dia. (ex. 6-19/ac)			BA	158 (127 - 190)	7 (6 - 8)	32 (26 - 38)	55 (44 - 66)	35 (28 - 42)	29 (23 - 46)			GGO - Young owlets require dense cover and/or leaning trees to escape predation. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. Tree Species: PIEN PICO
				Stand SDI	278 (222 - 353)	18 (15 - 22)	65 (52 - 77)	96 (77 - 115)	56 (44 - 67)	43 (34 - 72)			

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Table 3 - 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
LPD (Climatic) (High elevation Lodgepole pine plant associations including those adjacent to Mt. Hemlock) Indicators: BBWP	8 - 12 tons/ac. or 700 - 1000 ft³/ac. Snags: 100% ≥ 11" dbh (ex. 13-27/ac) Logs: 100% ≥ 11" dia. (ex. 34-72/ac)	ave 40%	≥ 1	TPA	360 (288 - 432)	150 (120 - 180)	170 (136 - 204)	40 (32 - 48)					BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. Tree Species: PICO ABMAS PIAL PIMO
				BA	83 (66 - 100)	7 (6 - 8)	45 (36 - 54)	31 (25 - 37)					
				Stand SDI	164 (132 - 198)	18 (15 - 22)	91 (73 - 110)	55 (44 - 66)					

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Tabl 2 Continued

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LPD (Climatic) (Lower elevations of Lodgepole pine plant associations) Indicators: BBWP, GGO, NG	8 - 12 tons/ac. or 700- 1000 ft³/ac. Snags: 100% ≥ 11" dbh (ex. 13-27/ac) Logs: 100% ≥ 11" dia. (ex. 34-72/ac)	ave 40%	≥ 1	TPA	353 (282 - 424	150) (120 - 180)	120 (96 - 144)	70 (56 - 84)	13 (10 - 16)				BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. GGO - Young owlets require dense cover and/or leaning trees to escape predation. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. Tree Species: PICO
				BA	117 (94 - 140)	7 (6 - 8)	32 (26 - 38)	55 (44 - 66)	23 (18 - 28)				
				Stand SDI	214 (172 - 259)	18 (15 - 22)	64 (52 - 77)	96 (77 - 115)	36 (28 - 45)				

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Table 3 - 2 Continued

PAG's	Snags/Logs * ≥ 9" (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean	Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
Unique Habitats (Climatic)												
Engelmann Spruce	25 - 35 tons/ac. or 2700 - 3700 ft³/ac. Snags: 50% 15-20" dbh (ex. 5.5-11/ac) 50% > 20" dbh (ex. 2.5-5/ac) Logs: 100% ≥ 15" dia. (ex. 21-43/ac)	50 - 100%	2 - 3	TPA	275 (220 - 330)	100 (80 - 120)	70 (56 - 84)	40 (32 - 48)	25 (20 - 30)	15 (12 - 18)	15 (12 - 18)	10 (8 - 12)	Tree Species: PIEN PICO
				BA	277 (222 - 332)	5 (4 - 6)	19 (15 - 23)	31 (25 - 37)	44 (35 - 53)	43 (34 - 53)	64 (51 - 77)	71 (57 - 85)	
				Stand SDI	418 (334 - 502)	12 (10 - 14)	38 (30 - 46)	55 (44 - 66)	69 (55 - 83)	63 (37 - 89)	89 (71 - 107)	≥75 (60 - 90)	
Aspen	When regeneration is no longer occurring, manipulation would occur in a mosaic pattern throughtout stand.												
Meadows	When tree encroachment reaches a 30% loss of meadow when compared to 1959 photos, meadow restoration would occur.												
Willow Patches	When willow patches reach 80% decadence, treatment of 20% of the willows would occur. This would be random shrubs throughout the patch.												

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ADDITIONAL RECOMMENDATIONS FOR MANAGING DEAD WOOD COMPONENT

Table 3-2 summarizes the recommended levels of snags and coarse woody debris needed to provide the desired suitable habitat conditions by PAG. Treated stands should retain dead wood that represents the species composition of the original stands. The material that is retained should be among the largest available. The recommendations listed below provide additional guidance in project implementation to help obtain and sustain the desired habitat conditions.

Management of Dead Wood in Existing Regenerated Areas (i.e. clearcuts)

Manage regenerated areas such that natural mortality will occur to create the desired dead wood components over time. In the first few decades this will be accomplished by leaving 15-30% of the area untreated within precommercial thinning units. In subsequent decades this will be accomplished by varying thinning densities in treated units.

Seek opportunities to redistribute "jackpot" coarse woody debris from adjacent stands and/or cull decks in existing regenerated areas.

Management of Dead Wood in Forested Areas That Do Not Need Treatment

Active snag or down wood creation is not recommended unless there are other objectives for entering a stand. Allow natural mortality to occur to provide snags and future down woody debris.

Management of Dead Wood in Forested Areas That Need Treatment

All treated stands should comply with the following guidelines:

- Retain dead wood that represents the species composition of the original stand.
- Retain material among the largest available on the site to meet dead wood requirements.
- Retain adequate green tree replacements to provide future dead wood at levels specified in Table 3-2.

Silvicultural treatments: Commercial thinning, selection cutting, shelterwood harvesting, firewood cutting, and underburning

All snags and coarse woody debris that meet the following size criteria will be retained in all decay classes to the greatest extent possible during harvest and post sale activities:

- Mixed conifer and ponderosa pine PAGs: Snags and logs > 9" diameter.
- Lodgepole PAGs: Snags and logs > 7" diameter.

If snags that meet the size criteria described above must be felled during harvest operations, they should be left on site as coarse woody debris.

If treated stands are below the following snag levels, snags will be created (or diseased trees retained) to accomplish this level:

- Mixed conifer and ponderosa PAGs: 4 snags/acre of > 16" dbh.
- Lodgepole PAGs: 5 snags/acre of > 7"dbh.

If trees are being felled to meet risk reduction objectives, whole trees that are among the largest felled should be left on site at levels specified in Table 3-2 for suitable habitat. No live trees should be felled

with the sole objective of meeting down woody debris requirements, i.e. trees that need to be felled to meet desired basal areas should be left on site rather than falling additional trees for down wood and taking the stand lower than target basal areas.

Silvicultural Treatment: Salvage of Dead Lodgepole

Salvage should not occur on disturbed sites smaller than 10 acres or where canopy cover is > 40% (ROD C-14).

Standing green overstory trees should be retained on site to the greatest extent possible to serve as a live stand component currently and as a source of dead wood in the future.

Snags and down woody debris will be retained on site to levels and criteria specified for suitable habitat in Table 3-2. Among the largest available dead wood on the site should be retained. Where the protection of an adjacent MSA is the objective for salvage activities (fuels reduction), snags and down wood may be retained at the low end of the recommended range. The majority of salvage units should retain dead wood at the high end of the recommended range.

At least one small (about 5' tall, 10' long, 10' wide; 100 square feet) grapple pile per acre and one landing pile (average 9' tall, 15 'long, 15' wide) per 100 acres should be retained to provide habitat for marten and its prey. Marten piles should have an abundance of protruding logs to serve as subnivian access points for marten and should contain some dirt and litter to enhance habitat for prey.

Silvicultural Treatment: Salvage of Dead Lodgepole Combined with Commercial Thinning of the Green Tree Component in Mixed Conifer Stands

Where available prior to harvest, five lodgepole snags per acre among the largest available on the site will be retained to provide foraging habitat for black-backed woodpeckers and other insectivorous birds.

In addition to the lodgepole snags listed above, all snags and down woody debris that meet the following size criteria will be retained in all decay classes to the greatest extent possible during harvest and post sale activities: Snags and logs > 9" diameter.

Silvicultural Treatment: Salvage of Dead Lodgepole Combined with Commercial Thinning of the Green Tree Component in Ponderosa Pine Stands

The need to retain lodgepole snags in ponderosa pine stands should be determined on a site-specific basis depending on objectives for a given MSA.

In addition to the lodgepole snags listed above, all snags and down woody debris that meet the following size criteria will be retained in all decay classes to the greatest extent possible during harvest and post sale activities: Snags and logs > 9" diameter.

LOS PROTECTION STRATEGIES

The goal of the LOS protection strategy is to move the Davis LSR toward the desired balance of vegetative conditions as quantified in Table 3-1 in order to reduce the risk of losing the desired late and old-structured components at catastrophic levels to insects, disease, and/or wildfire in both the short and long-term. The urgent and aggressive nature of this strategy is in response to an analysis of over 60,000 acres of stand exams conducted in a 155,000 acre project area that encompassed over 90% of the Davis LSR.

The results of the project level analyses support the assumptions of the LSR team and the findings of the Science Team. There is an immediate need to reduce the risk of losing the desired LOS components within the Davis LSR. The urgency for action does not include the area designated as "mountain hemlock for wolverine and black-backed woodpecker" (MSA - B). This area is still believed to be within its historic range of variability and represents the desired balance of vegetative conditions.

The focus of the protection strategy is to aggressively adjust the existing balance of vegetative conditions in the mixed conifer and lodgepole PAGs within and around the LSR to a more sustainable balance over the next five years. However, the aggressiveness of treatments in terms of scale and scheduling is limited by the desire to retain the existing function of the Davis LSR for known late-successional and old-growth forest related species that currently utilize and depend on existing habitats within the LSR for their viability.

VEGETATIVE MANAGEMENT

Based on the existing conditions and functions within each Management Strategy Area, the LSR team has recommended appropriate and inappropriate areas in which to manipulate the existing vegetative condition in the short-term in order to retain a functional LSR in the short and long-term. The following provides an overview of the protection strategy for the lodgepole and mixed conifer PAGs. Site-specific opportunities and constraints are identified for each MSA in Chapter 4. Refer to Figure 3-2.

Table 3 - 3, Opportunities for Risk Reduction

Priority 1 MSAs	Priority 2 MSAs
K, L, M, N, P, Q, T, BB	D, F, G, H, Z

Lodgepole PAGs

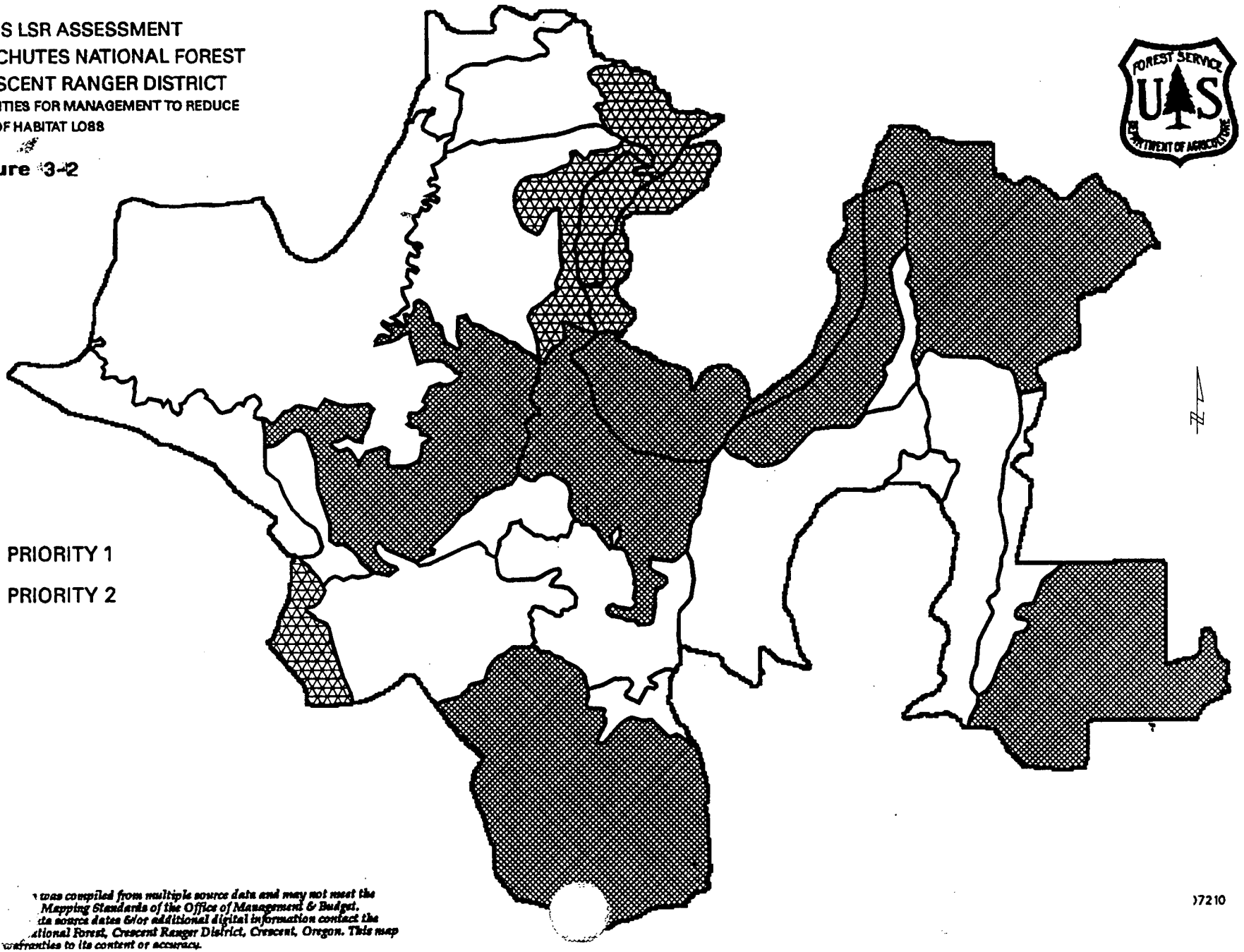
The desired condition of lodgepole pine PAGs that occupy the LaPine Basin surrounding Davis Lake is to have at any given point in time approximately 50% of the area in large contiguous blocks (1000+ acres) of suitable climatic lodgepole habitat. This rotation of large blocks will help ensure the presence of effective lodgepole habitat throughout the short and long-term.

Currently, an existing Old Growth Management Area (MSA - Y) comprises one such block of mature and overmature lodgepole. The high water table and presence of Odell Creek create unique riparian habitats within this MSA and reduce the risk of catastrophic wildfire. At this time, no risk reduction activities are recommended in this block because of its current function within the LSR.

Most of the remaining lodgepole areas are highly fragmented and have experienced a significant amount of overstory collapse due to a bark beetle epidemic. These areas contain high levels of dead and down

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
PRIORITIES FOR MANAGEMENT TO REDUCE
RISK OF HABITAT LOSS

Figure 3-2



Orig... was compiled from multiple source data and may not meet the Ll... Mapping Standards of the Office of Management & Budget. For ... data source dates &/or additional digital information contact the Des... National Forest, Crescent Ranger District, Crescent, Oregon. This map has no warranties to its content or accuracy.

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lodgepole which translates to a high fire hazard within the LSR. At this time, salvage activities could be employed to begin the development of another large contiguous block of lodgepole and start the desired rotation of suitable habitat.

Within the next five years, up to 1000 acres of lodgepole pine could be actively managed to develop a contiguous block of suitable habitat in the long-term. This block would be treated to attain the habitat conditions described in Table 3-2 and MSAs L and M in Chapter 4. Treatments should occur within the parameters set forth in the "Additional Recommendations for Managing Dead Wood Component" described in this chapter and guidelines in the Northwest Forest Plan (C-13).

Mixed Conifer PAGs in Climatic-Climax and Fire-Climax Conditions

Based on recommendations from the Science Team to attain a sustainable balance of late-successional suitable habitat within the mixed conifer PAGs, approximately 40% of the mixed conifer dry PAG should be in the climatic-climax condition and 10% in the fire-climax condition (Table 3-1). The mixed conifer wet PAG may have 60% in the climatic-climax condition and still be considered sustainable.

At this time, 53.5% of the mixed conifer PAGs (32% of the entire LSR) or approximately 15,451 acres within the Davis LSR functions as climatic-climax suitable habitat. Less than 25% of this area is occupied by the mixed conifer wet PAG. Less than 1% of the area within the mixed conifer PAGs is currently considered be in the fire-climax condition due to the exclusion of historic fire regimes. Fire suppression activities have allowed the majority of unharvested mixed conifer stands to progress toward the climatic-climax condition.

The majority of the stands in the climatic-climax condition have been determined to be at high risk of losing their late and old-structured components such as large diameter ponderosa pine and Douglas-fir to insect attack and/or wildfire. These components if lost, are not easily replaced within the Davis LSR due to a shortage of replacement trees of adequate size and/or species composition. Currently, white fir and lodgepole comprise the majority of second-story vegetation and are not considered suitable replacement trees.

It is recognized that these existing conditions developed over several decades. In most cases, returning the desired percentage of these stands to a tree density below the upper management zone (sustainable habitat) will require a similar amount of time and involve several entries or treatments. The retention of the existing function of the LSR in the short-term also limits the timeline for attaining the desired balance of vegetative conditions within the mixed conifer PAGs.

The following parameters are recommended to guide the transition of the existing condition to a sustainable balance of LOS conditions within the mixed conifer PAGs (Table 3-1):

- In general, any harvest activity that removes more than 1/3 of the existing basal area can leave a stand susceptible to windthrow and may even temporarily reduce growth of the residual stands due to the sudden exposure of shade needles to intense sunlight. Most of the imminently susceptible stands will need more than 1/3 of the existing basal area removed to attain the desired UMZ. Subsequent treatments will be needed within these stands over the next 20 years.

- Although the following areas are imminently susceptible to insect attack and/or wildfire, in order to maintain a functional LSR in the short-term for known old growth dependent species, no treatments should occur within these areas over the next 20 years unless stands begin to lose desired strucutral components at catastrophic levels:

  -- Nesting, roosting, foraging habitat within the home range radius (1.2 mile) of the known spotted owl nest sites;

-- MSAs I, J and V which currently serve as key connectivity areas within the LSR and surrounding landscape for the northern spotted owl;

-- Existing designated Old Growth Management Areas;

-- Riparian Reserves; and

-- Existing stands of climatic-climax suitable habitat that do not have the potential to respond to risk reduction treatments. These areas would possibly function as old growth for a longer period if left alone.

Within these parameters, silvicultural treatments should begin immediately to reduce the existing percentage of mixed conifer stands determined to be imminently susceptible to insect attack and/or wildfire. Based on the Science Team's recommendations, the existing 53.5% of mixed conifer PAGs in the climatic-climax condition should be reduced to approximately 40%. This translates to 13.5% or approximately 3,900 acres of existing climatic-climax habitat in need of treatment. These acres may decrease slightly based on the fact that stands within the mixed conifer wet PAG can retain a higher percentage of stands in the climatic-climax condition (60%).

At this time, pathologists, entomologists, and silviculturists have determined that treatment of the available 3,900 acres is urgent and should occur within the next 20 years in conjunction with risk reduction treatments outside the LSR. Within the LSR, 25-50% of 3,900 acres should be treated within the next five years to provide immediate and effective protection against a catastrophic loss of LOS within the Davis LSR. This could result in a maximum of 1,950 acres of existing climatic-climax suitable habitat being treated over the next five years. The remaining 50-75% of the area in need of treatment would occur over the following 15 years as appropriate, based on monitoring results.

The objective of these treatments is to transition the 3,900 acres to stand densities below the upper management zone (<100% UMZ) and restore 10% of the mixed conifer dry PAG to a fire-climax condition over time. The following four scenarios describe how the recommended treatments will accomplish these objectives and affect climatic-climax habitat. Figure 3-3 is an illustration of the existing condition.

Scenario A: This would be the primary treatment strategy in stands managed for the northern spotted owl and associated species. See Figure 3-4.

This scenario is described as 90% of the UMZ, multi-story. Treat stands currently at high risk in order to lower the existing tree density to 90% of the UMZ. A maximum of 1/3 of the basal area will be treated per entry. The highest possible quality of existing climatic-climax habitat will be retained. Trees should be removed from most or all of the size classes (depending on the existing stand structure) in such a way that all of the existing canopy layers would remain. Most of the mixed conifer wet and dry stands outside the Bald Eagle Management Area (BEMA) would be included in this scenario.

Following treatment(s), some stands (particularly in good sites in the mixed conifer wet PAG) may remain NRF habitat following treatment. This is dependent on stand densities prior to treatment, levels of large down wood and snags retained during the operation, and residual stand damage (i.e. loss of seedlings, saplings, pole-sized and understory trees).

The majority of the treated stands will not retain all of the habitat components and structure that are believed important for the life cycle and reproductive success of spotted owls. On average stands will lack the canopy cover and vertical structure that characterize suitable NRF habitat. It is also likely that harvest operations will remove some of the dead wood component and may impact the spotted owl prey base availability in the short-term. Treated stands are expected to retain > 50% canopy cover and will remain in a multi-storied forested condition with a substantial large tree component.

In summary, treated stands will remain high quality foraging habitat and will have the potential to meet suitable NRF habitat conditions again in approximately two decades.

Scenario B: This would be the primary treatment strategy in stands managed for the fire-climax associated species such as the bald eagle. See Figure 3-5.

This scenario is described as 90% of the UMZ, single-story. Treat stands currently at high risk in order to lower the existing tree density to 90% of the UMZ. A maximum of 1/3 of the basal area will be treated per entry. Maximize the removal of understory trees to attain the desired condition. Overstory trees will be removed only if necessary to reach the desired condition, and then, only after individual tree consideration. The intent of this scenario is to retain the overstory canopy and a seedling/sapling layer. Most of the mixed conifer dry and ponderosa pine stands in the BEMAs would be included in this scenario.

Following treatment(s), stands will meet criteria for dispersal habitat and are expected to serve a dispersal function for spotted owls. Foraging habitat for spotted owls is generally characterized by two canopy layers. Treated stands will lack the canopy cover and vertical structure that provides thermal regulation benefits and predator protection for owls. Although owls may utilize this habitat type for foraging, it is not expected to provide "good foraging habitat". The area will function as sustainable and functional bald eagle habitat.

Scenario C: This would be the primary treatment strategy in stands managed for the northern spotted owl and associated species and planned for long-term and/or replacement habitat development. See Figure 3-6.

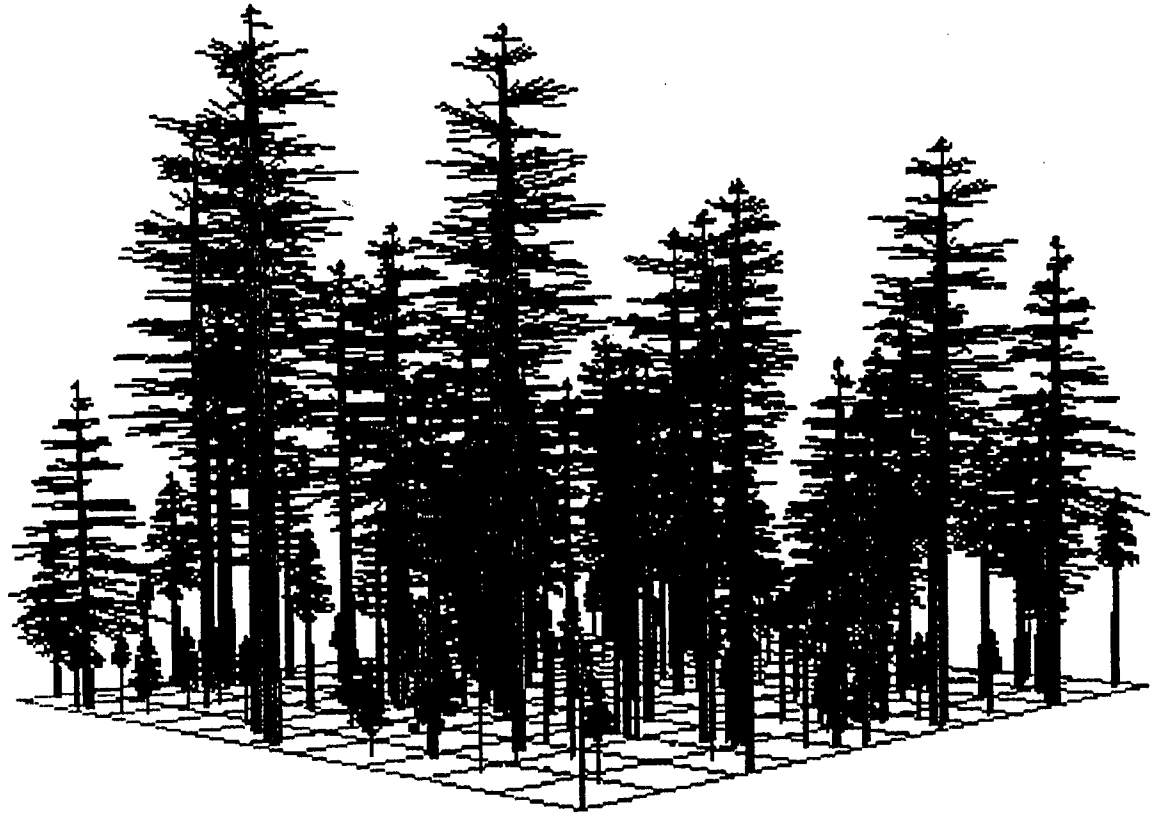
This scenario is described as 67% of the UMZ, multi-story. Treat stands currently at high to moderate risk in order to lower the existing tree density to 67% of the UMZ. A maximum of 1/3 of the basal area will be treated per entry. Trees should be removed from most or all of the size classes (depending on the existing stand structure) in such a way that all of the existing canopy layers would remain. Mixed conifer wet and dry and ponderosa pine stands outside the BEMA would be included in this scenario to develop resistant stands in the short-term in order to obtain suitable habitat in the long-term. Some lodgepole pine stands important as dispersal habitat could also be included in this scenario. Many of these stands would currently be considered suitable climatic-climax habitat.

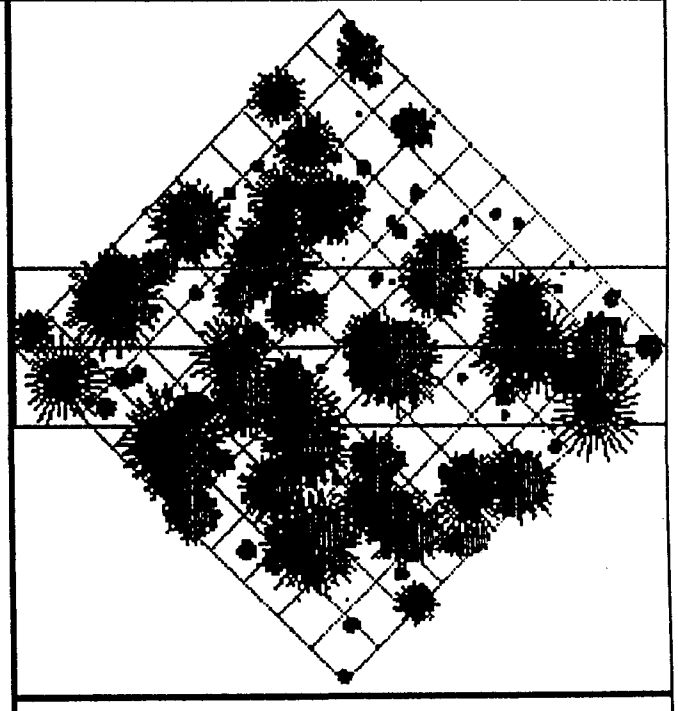
Following treatment(s), stands will remain in a multi-storied condition with a substantial large tree component. However, they will not provide the canopy cover or vertical structure characteristic of suitable NRF habitat or good foraging habitat for the northern spotted owl. Treated stands will serve as dispersal habitat and have the potential to become suitable NRF again in approximately three to five decades.

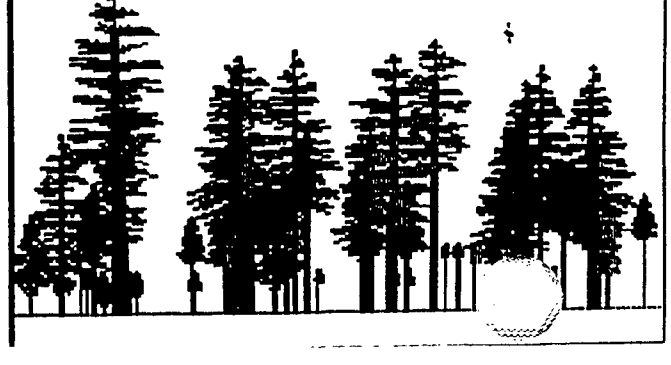
Scenario D: This would be the primary treatment strategy in stands managed for the fire-climax associated species, such as the bald eagle, and planned for long-term and/or replacement habitat development. See Figure 3-7.

This scenario is described as 67% of the UMZ, single-story. Treat stands currently at high to moderate risk in order to lower the existing tree density to 67% of the UMZ. A maximum of 1/3 of the basal area will be treated per entry. Trees would be removed from the understory with some of the smaller overstory removed if necessary to reach the desired condition. The intent of this scenario would be to retain the existing overstory canopy and some of the seedling/sapling layer. Most of the mixed conifer dry and ponderosa pine stands in the BEMAs and some lodgepole pine stands would be included in this scenario.

Following treatment(s), stands will minimally meet dispersal habitat criteria and function for the northern spotted owl, however they will provide functional, sustainable bald eagle habitat.

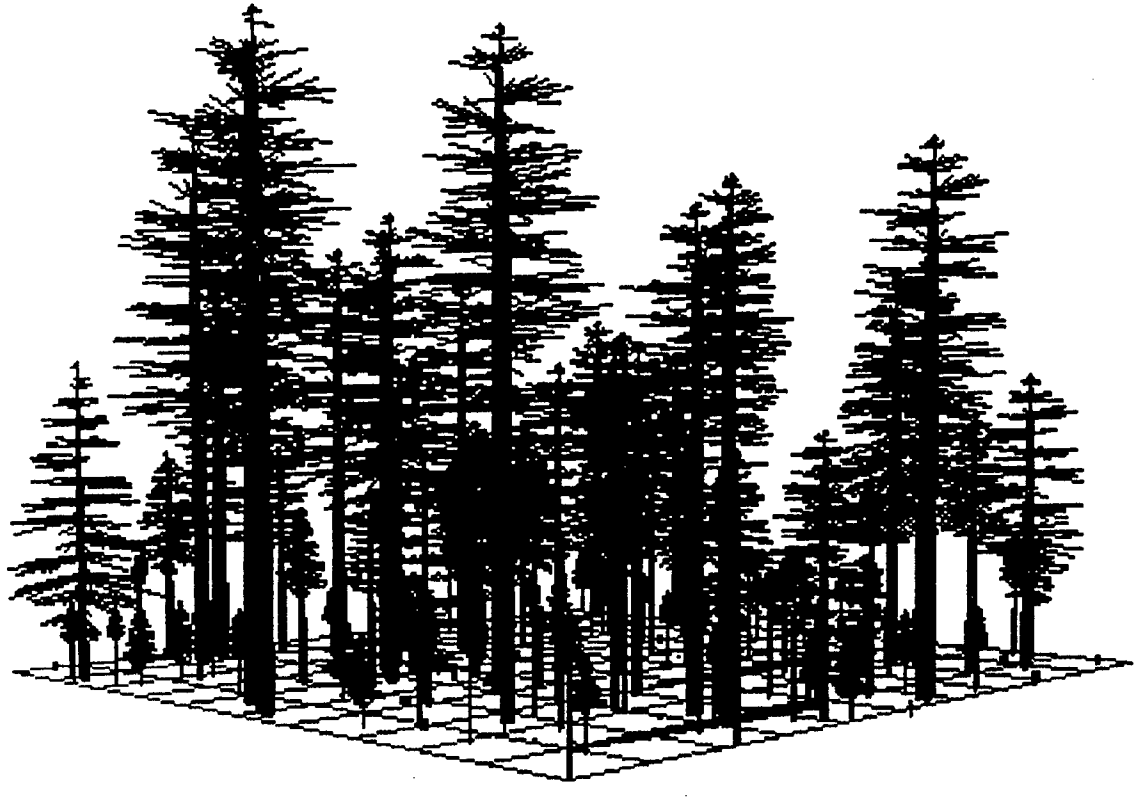


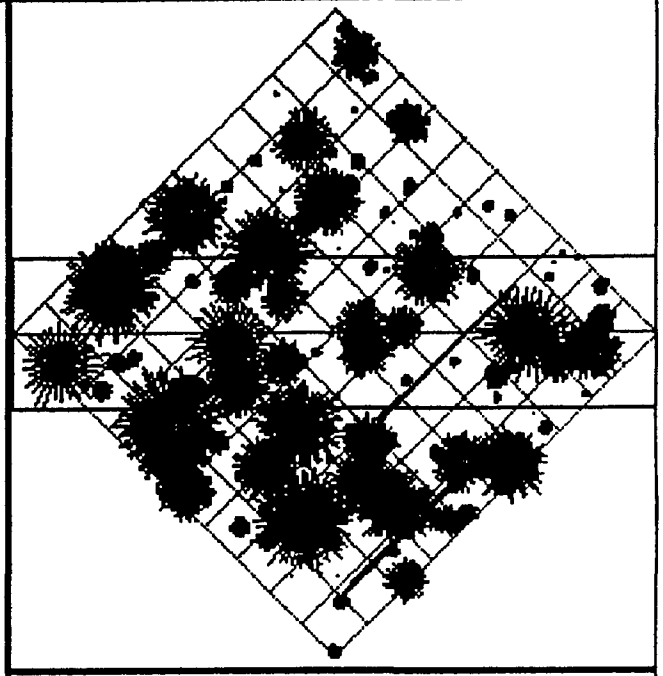




Stand 112
Original (Existing) Condition

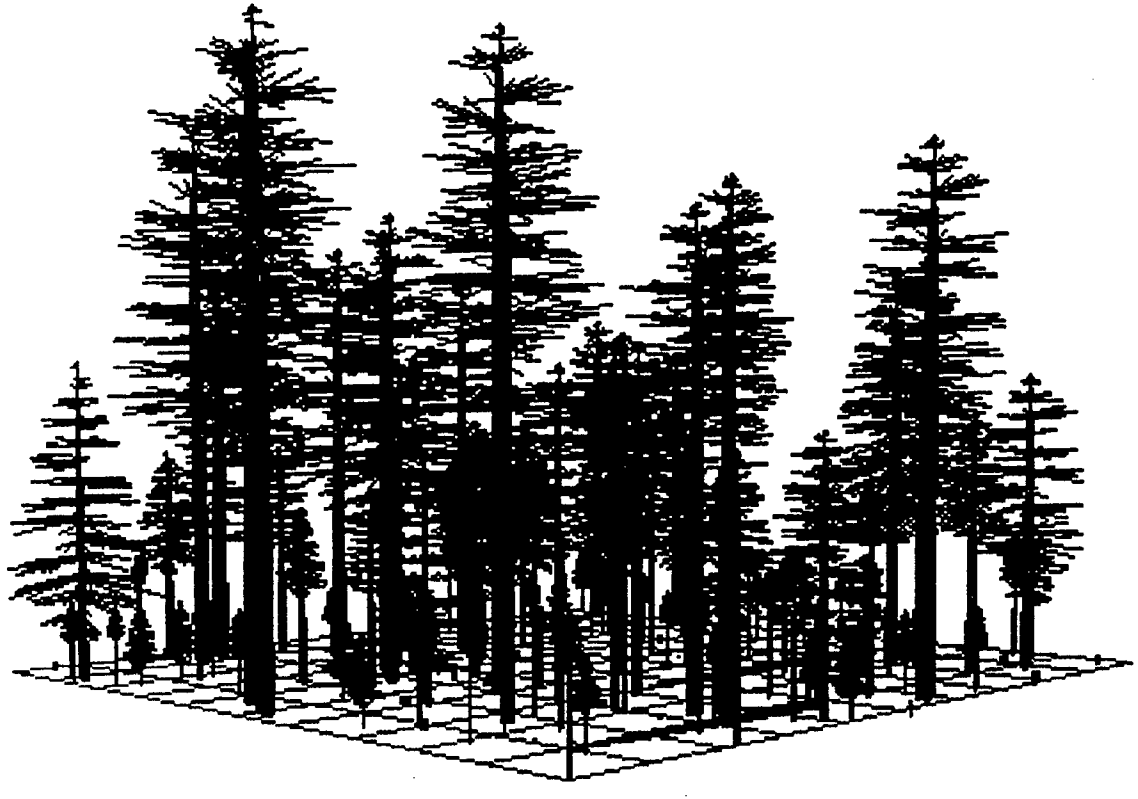
Figure 3-3

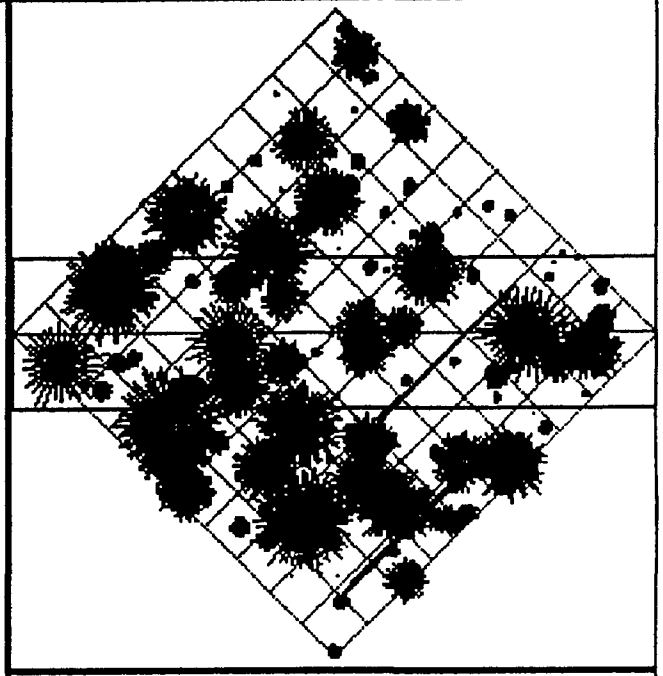




Stand 112 - Treatment Scenario A
90% UMZ, Multi-story

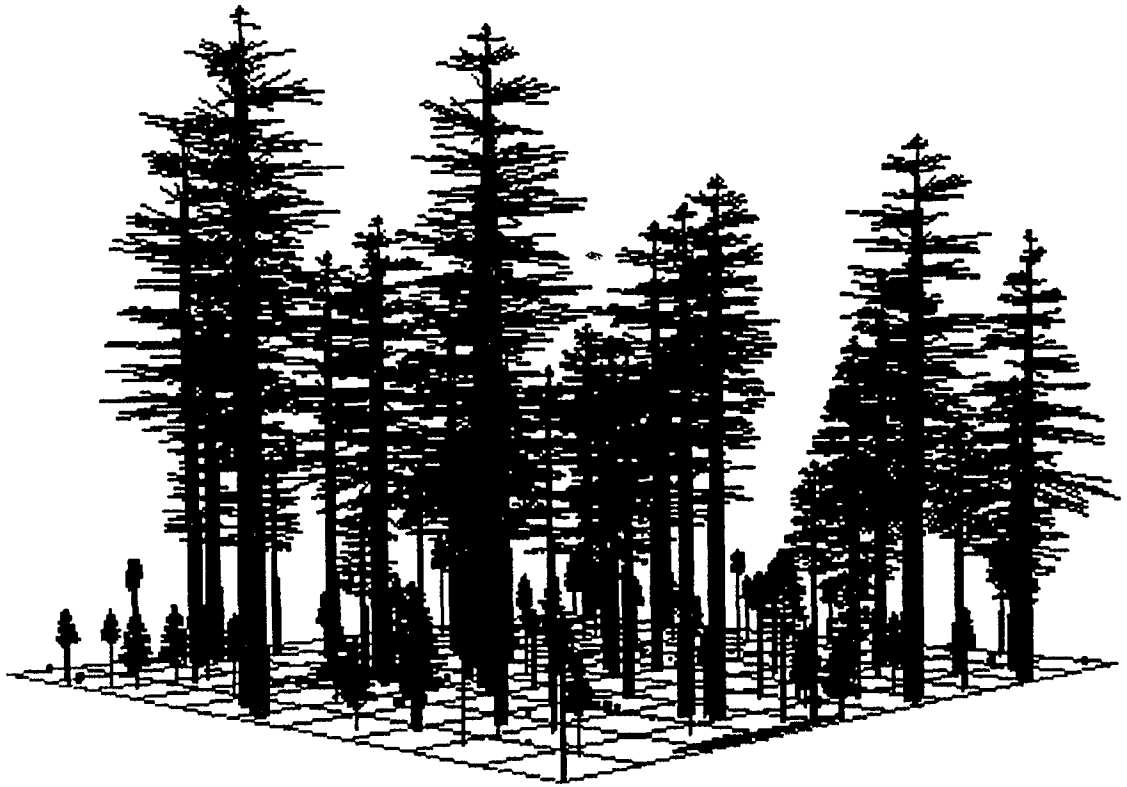
Figure 3-4

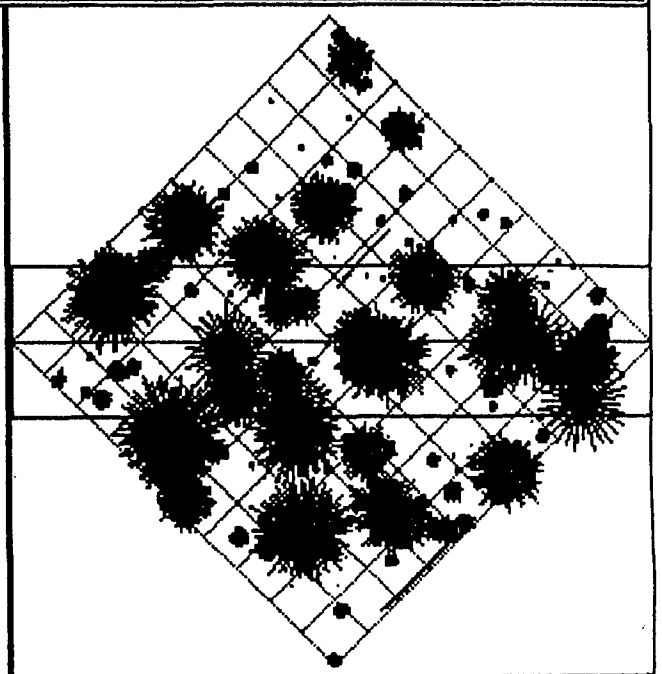




Stand 112 - Treatment Scenario A
90% UMZ, Multi-story

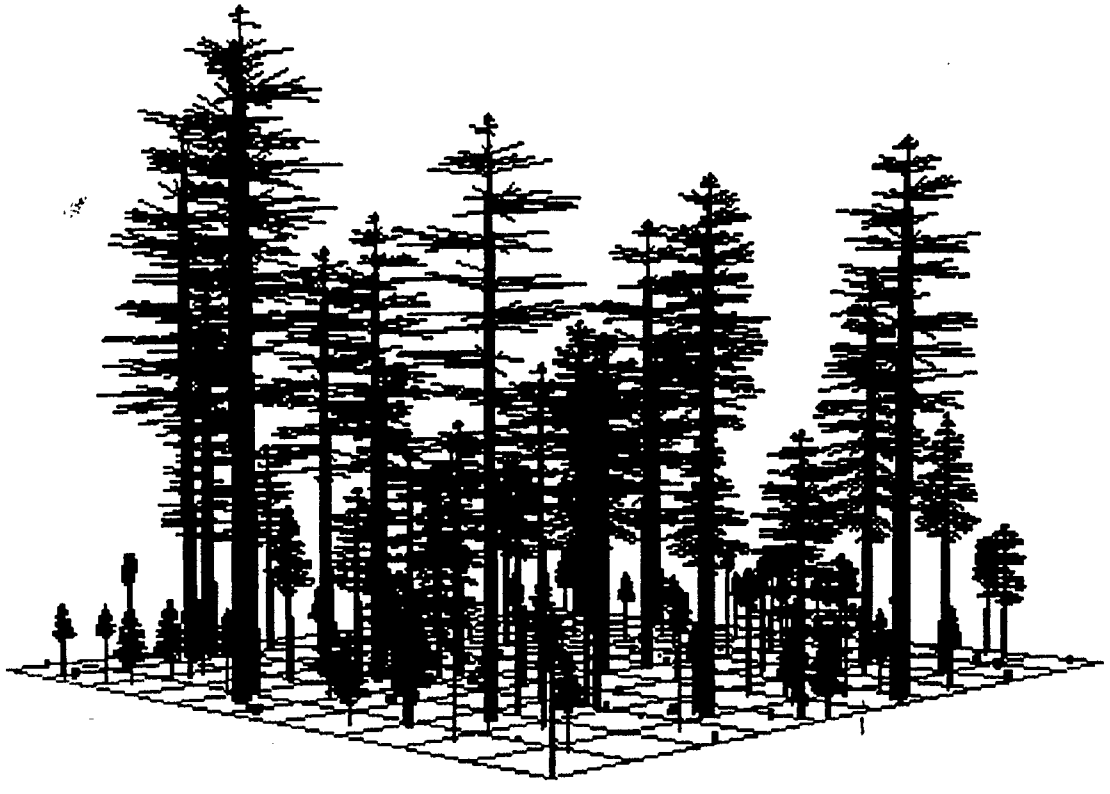
Figure 3-4

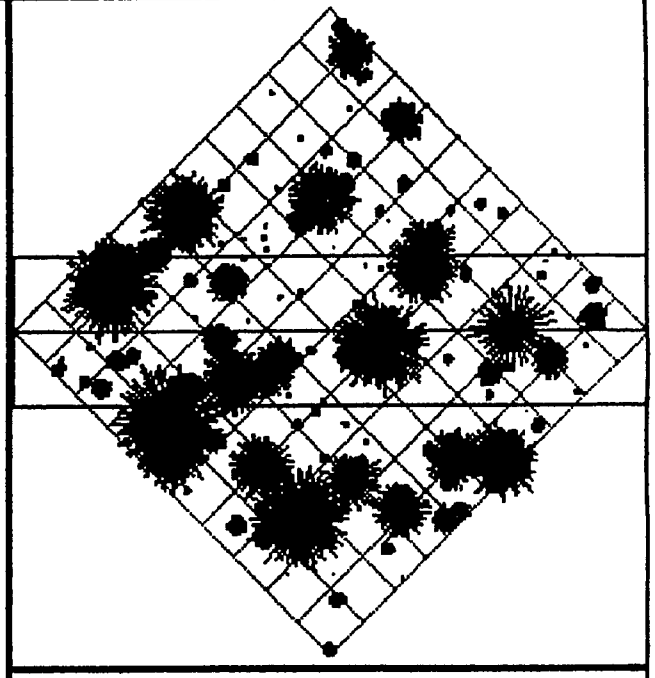


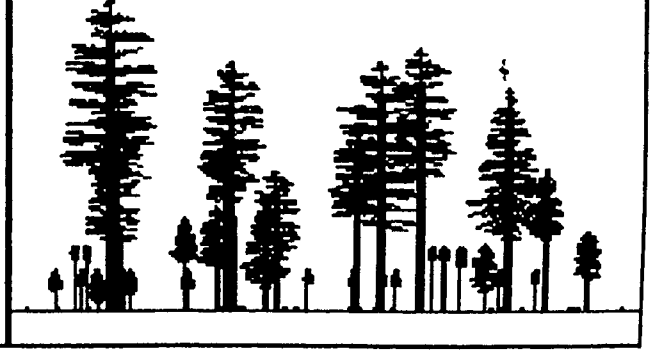


Stand 112 - Treatment Scenario B
90% UMZ, Single-story

Figure 3-5

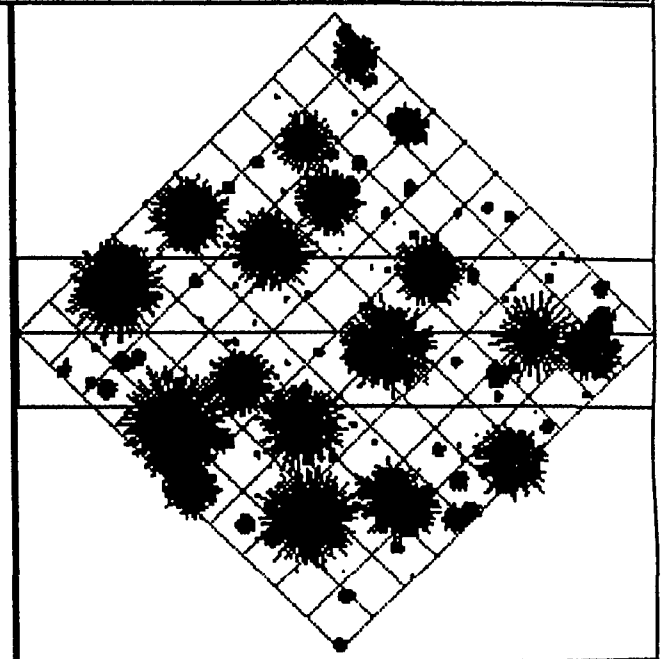


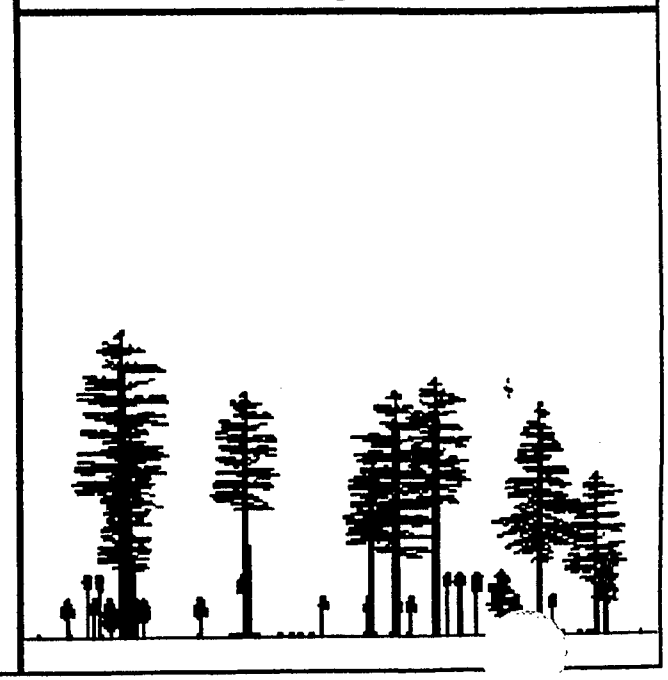




Stand 112 - Treatment Scenario C
67% UMZ, Multi-story

Figure 3-6





Stand 112 - Treatment Scenario D
67% UMZ, Single-story

Figure 3-7

Large Trees

Protection of large trees (trees > 21" dbh) is of paramount importance in the Davis LSR. Harvest of these trees will be avoided, if possible. Suitable conditions for the removal of large trees are anticipated to be rare.

There may be instances where cutting of larger trees is necessary to meet resource objectives. In NRF habitat for spotted owls within the LSR large trees will not be removed from the site without site-specific approval of the District Ranger. Large trees may be killed and left standing or felled in the case of safety concerns or skyline corridor clearing. To the extent possible, these trees would not be included in the treatment objectives for the site. The following describes circumstances when cutting or killing large trees (21"+) may occur within the LSR:

Overstory Removal of trees highly infected with dwarf mistletoe may occur where conditions are such that the developing understory (of the same species) in areas > 10 acres will be prevented from reaching LOS. Each large tree will be considered individually.

Partial Cutting will not cut trees over 21" DBH unless there are two or more trees 21" or larger left within 50 feet of the tree to be cut. The following are cases where large trees may need to be cut:

-- To remove scattered mistletoe infected trees in relatively clean stands to prevent spread of the disease;

-- Stands with stocking above UMZ in trees 21"+ and the smallest of the big trees will need to be cut/killed to obtain desired stocking levels;

-- Mixed species stands where true fir are removed to reduce host trees for western spruce budworm; and

-- Stands where a multi-story condition is desired, such as for great gray or spotted owls, and it is necessary to remove large trees to maintain smaller trees in the stand.

Fire Suppression

The following is an overview of the fire suppression priorities for the Davis LSR:

Priority 1 for fire suppression implies protection of human life and property, improvements and investments, and/or owl activity centers. Priority 2 applies to riparian zones and primary wildlife corridors. Priority 3 applies to all other areas.

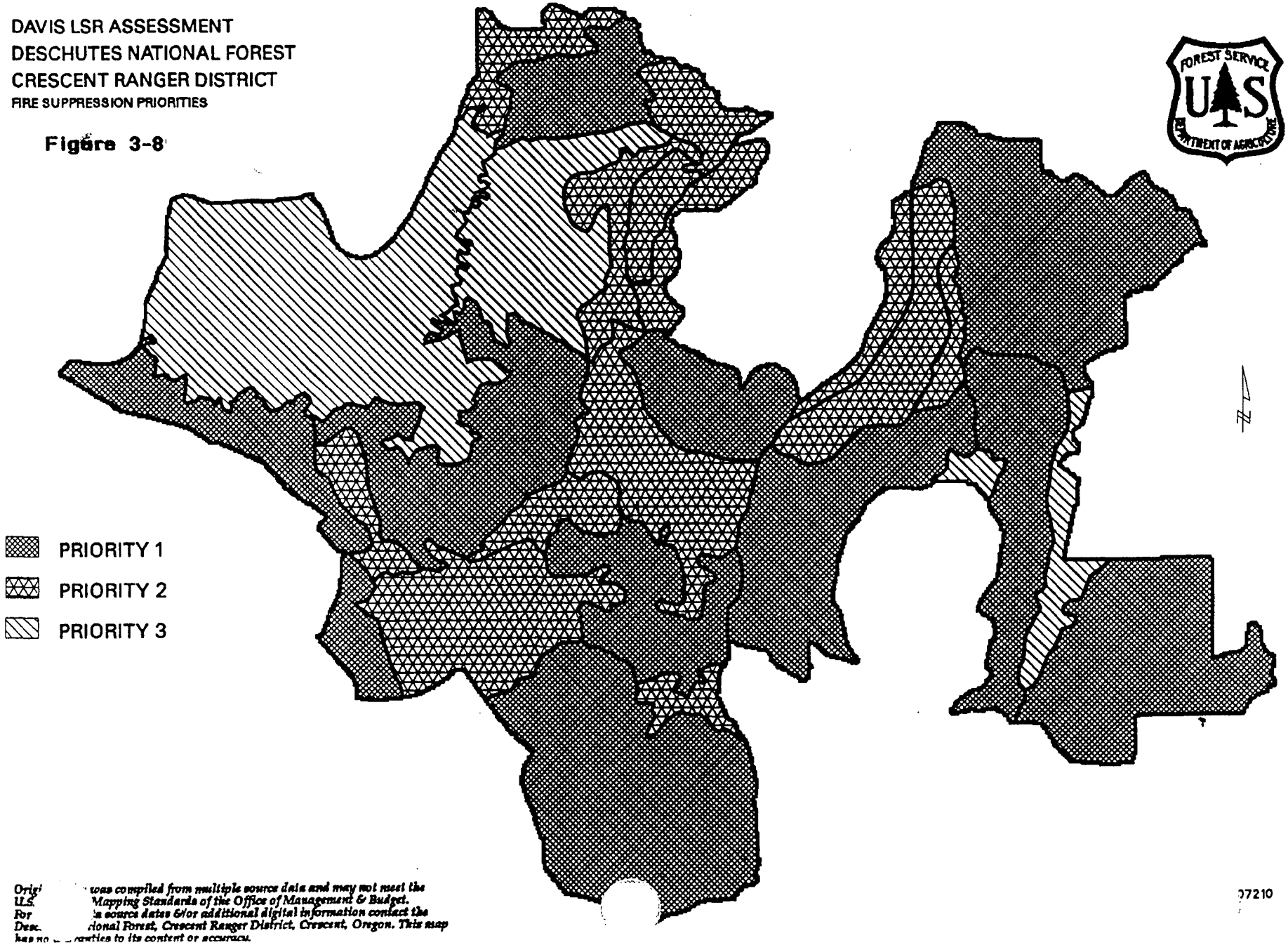
Fires that threaten life, property, public and firefighter safety, improvements, or investments shall be given high priority to suppress in order to minimize losses. Refer to Figure 3-8.

Table 3 - 4, Fire Suppression

Priority 1 MSAs	Priority 2 MSAs	Priority 3 MSAs
C, I, K, M, Q, S, T, V, W, Z, BB	A, D, F, G, H, J, L, N, O, P, X, Y, AA	B, E, R, U

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
FIRE SUPPRESSION PRIORITIES

Figure 3-8



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Animal Damage Management

Animal damage management activities may be appropriate to protect desired habitat components within the LSR. Endemic levels of animal damage do not justify control activities. Specific NEPA analysis must be completed and should include discussion of both natural and artificial control methods, e.g. introducing fisher to help control porcupine populations in some portion(s) of the LSR. Animal damage control should not occur prior to completion of forest carnivore surveys and should not detrimentally impact LOS associated species.

LOS ENHANCEMENT STRATEGIES

The LOS enhancement strategy addresses activities in the Davis LSR that are either neutral or beneficial to the LSR in terms of maintaining or enhancing the desired late and old-structured habitat components as quantified in Table 3-2. The overall priority for enhancement activities is to treat regenerated areas such as past clearcuts, shelterwoods, and seed tree harvest units to accelerate tree growth as a means to return to LOS more quickly.

Regenerated Areas

The top priority for treatment within regenerated areas was assigned to MSAs containing owl activity centers. The order of the owl MSAs is based on the amount of existing nesting, roosting, and foraging habitat in owl home ranges. Pre-commercial thinning (PCT) will result in more rapid development of suitable NRF habitat than would occur without treatment. In general, PCT prescriptions should maximize tree growth while maintaining stand diversity options. Selected PCTs may sacrifice growth maximization to meet specific resource objectives, e.g. cover in critical deer and elk fawning and calving areas.

Second priority was assigned to areas that are currently highly fragmented but potentially can provide important habitat links in the mixed conifer PAGs. The third priority was assigned to highly fragmented MSAs in the lodgepole pine PAGs.

These priorites were determined by the LSR team. If, however, it is more logistically feasible or cost effective to complete these activities in an order different than recommended above, it would be acceptable provided that the Priority 1 and 2 areas were treated within 3-5 years after completion of NEPA analysis and documentation.

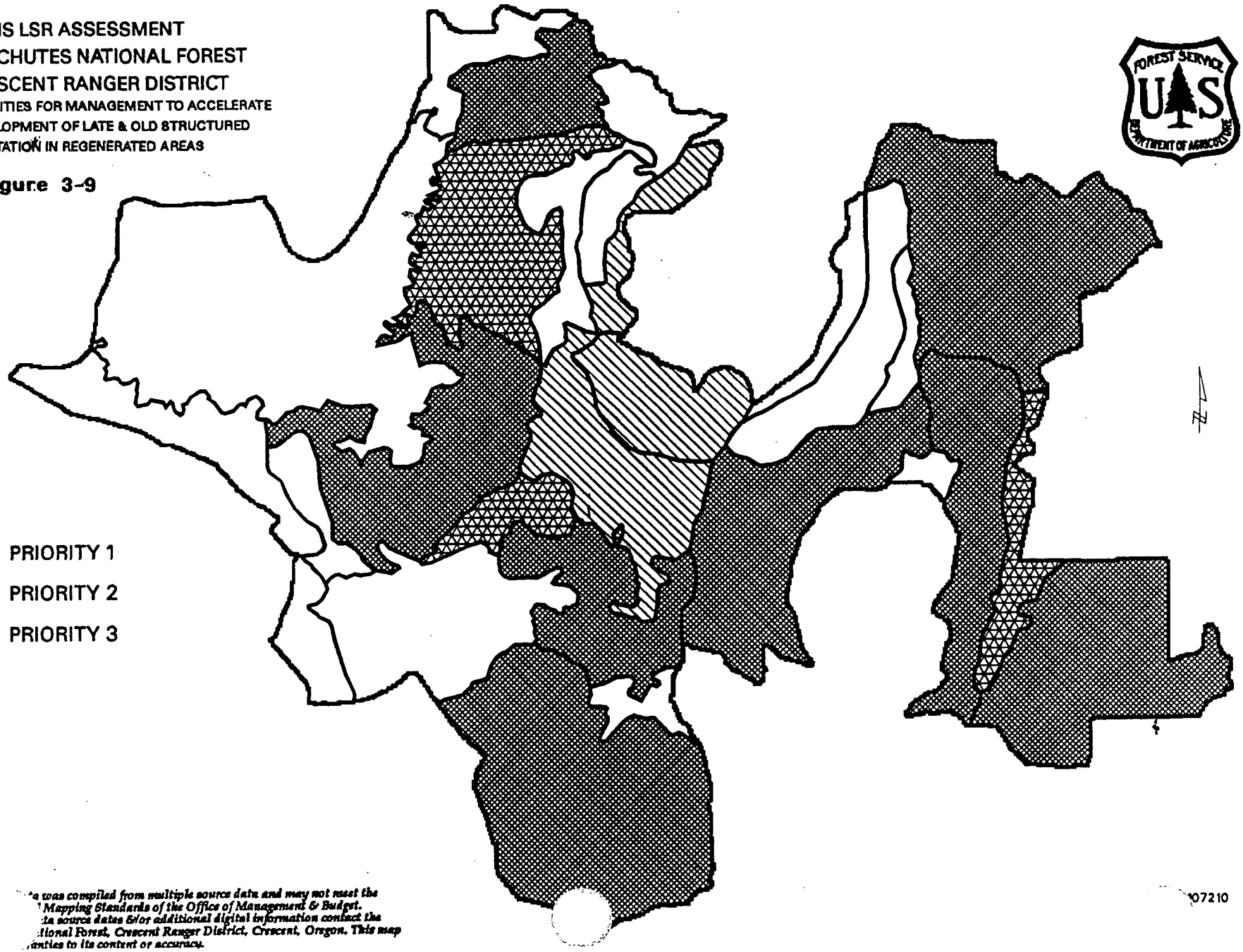
The MSAs are ranked in the order of priority within the overall 1, 2, and 3 categories. Refer to Figure 3-9.

Table 3 - 5, LOS Enhancement in Regenerated Areas

Priority 1 MSAs	Priority 2 MSAs	Priority 3 MSAs
K, BB, C, W, T, S, Q, V	E, X, R	L, M, H

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
PRIORITIES FOR MANAGEMENT TO ACCELERATE DEVELOPMENT OF LATE & OLD STRUCTURED VEGETATION IN REGENERATED AREAS

Figure 3-9



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Thinning of pre-commercial sized trees within all MSAs should occur within the following parameters:

-- Use mechanical thinning methods to manipulate densities and species mixes appropriate to the site. The objective would be to reach the UMZ and commercial thinning size at approximately the same time.

-- Maintain between 15-30% of the regeneration stands in unthinned conditions at this time to promote a diversity of structure. Refer to "Habitat Connectivity" further below for additional rationale.

-- Maintain or enhance a diversity of species and structural composition within units and across the landscape.

-- In mixed conifer units where the desired condition is climatic-climax suitable habitat, maintain no more than 50% of the trees in true firs.

-- Manage stands to allow development of endemic levels of mistletoe, heartrot, and tree deformity to provide wildlife habitat.

-- In mixed conifer units where the desired condition is fire-climax suitable habitat, maintain ponderosa pine and Douglas-fir as the primary stand components.

-- Refer to "Additional Recommendations for Managing Dead Wood Component" in this chapter for information concerning dead wood recruitment in regenerated areas.

-- Fertilizer is appropriate to apply if determined to be feasible. Fertilizer should be applied unevenly throughout the regenerated areas to promote a diversity of densities and structure within the unit.

-- Use innovative means to accomplish these objectives if necessary. For example, selling Christmas trees in units with designated cut or leave tree may be an option.

Forested Areas

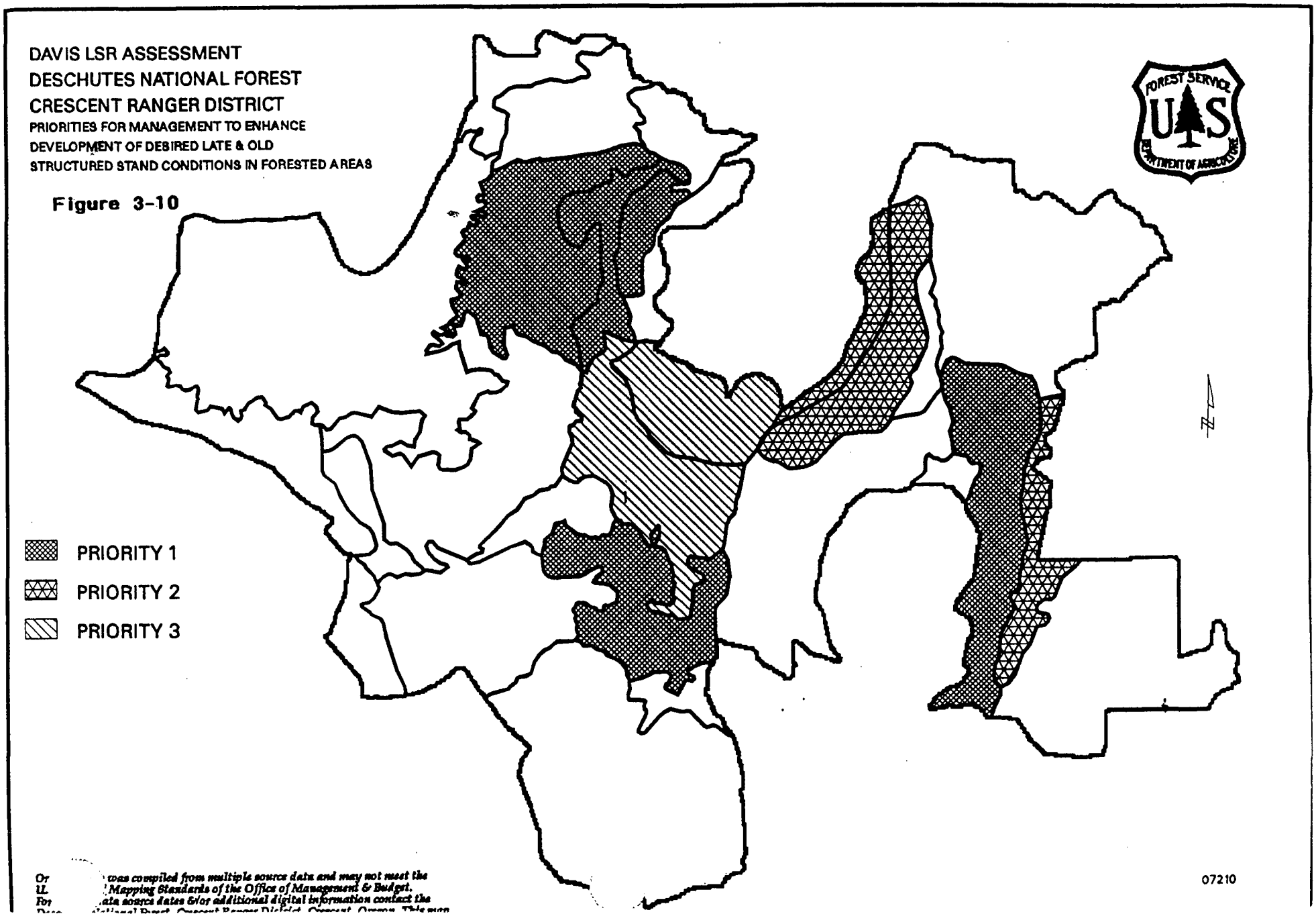
Enhancement activities are only appropriate in those areas that are not functioning as suitable LOS habitat. Activities included in this prioritization scheme include: treatments to accelerate the development of suitable climatic-climax habitat for the spotted owl; treatments to develop and maintain a fire-climax condition in BEMAs and other appropriate areas; and treatments to develop and maintain a viable lodgepole LOS forest. Priorities were based on the existing condition of the habitat and desired function of the MSA. See individual MSAs for specific rationale. Refer to Figure 3-10.

Table 3 - 6, LOS Enhancement in Forested Areas

Priority 1 MSAs	Priority 2 MSAs	Priority 3 MSAs
E, F, G, S, W	N, O, R	L, M

Selective thinning, tree culturing and underplantings are the primary enhancement activities recommended for forested areas that do not meet the characteristics of suitable LOS habitat.

Selective Thinning - Selective thinning would be appropriate in previously harvested stands within the mixed conifer PAGs where the overstory has been eliminated and the understory is primarily comprised


DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
PRIORITIES FOR MANAGEMENT TO ENHANCE
DEVELOPMENT OF DESIRED LATE & OLD
STRUCTURED STAND CONDITIONS IN FORESTED AREAS
Figure 3-10
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
PRIORITY 1
PRIORITY 2
PRIORITY 3
was compiled from multiple source data and may not meet the
Mapping Standards of the Office of Management & Budget.
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of true fir and lodgepole. Selective thinnings would be prescribed to move the stands toward suitable LOS habitat for the emphasis species as quantified in Table 3-2. Treatments would either move toward a multi-story structure to attain the climatic-climax condition or a single-story fire-climax condition. Ponderosa pine and Douglas-fir would be favored for retention in all mixed conifer and ponderosa pine PAGs.

Selective thinning in lodgepole PAGs is appropriate in MSAs R, W, X, and BB to attain the uneven-aged objective and provide dispersal habitat for the spotted owl.

Tree Culturing - Tree culturing consists of removing all competing trees for a distance around existing large trees to help sustain them throughout the short and long-term. This activity would favor large ponderosa pine and Douglas-fir in the mixed conifer PAGs. This activity is most appropriate in stands managed to attain the fire-climax condition and bald eagle habitat.

Treatments should be designed to modify the form of potential nest trees for the bald eagle so that lateral branches develop that are capable of supporting nests in the future. This may involve the removal of all competing trees for a distance around large ponderosa pine and Douglas-fir so that lateral branches are not shaded by competing vegetation.

Tree culturing in mixed conifer to attain suitable climatic-climax habitat should only occur to diversify the structure of stands and accelerate the growth of future large trees.

Tree culturing in lodgepole pine is appropriate in MSAs R, W, X, and BB to attain an uneven-aged condition and provide dispersal habitat for the spotted owl.

Underburning - In stands which are emphasizing fire-resistant species such as ponderosa pine and Douglas-fir, underburning may be appropriate for enhancement of those species. Underburning should be considered in the existing ponderosa pine and Douglas-fir plantations once they have grown to sufficient size to be relatively fire resistant. This would probably occur sometime in the next 20 to 40 years. Underburning can be used to maintain and favor these species until such time as it is determined that an understory should develop for multi-storied stand objectives.

Underplantings - Species diversity can be enhanced through underplantings of more shade tolerant species that have longer lifespans. Douglas-fir should be underplanted when the canopy cover is less than 35% in portions of the mixed conifer PAGs. Blister rust resistant white pine should be planted in mountain hemlock root rot pockets and other suitable areas to ensure that white pine is present in the LSR in the future.

Habitat Connectivity

Various management activities, such as salvage, thinning, and prescribed fire, are recommended by the LSR team as appropriate tools to utilize in the event that they are needed to accomplish protection and/or enhancement goals. However, it is recognized that maintaining connectivity of LOS habitat throughout the LSR is also essential and must be a primary consideration in the application of these tools.

It is recognized that management activities as indicated above may isolate populations of some species or impact unique habitats. Thus, prior to implementation, the potential implications of management activities should be duly weighed against the potential implications of no activity. The following are some of the mitigations that the team believes will facilitate retention of habitat connectivity for many species:

- Leaving 15-30% of any unit in an untreated condition. Implementation of this mitigation for all management activities, commercial and precommercial thinning, salvage, burning, firewood cutting, etc., will preserve biological legacies, retain biodiversity, and enhance dispersal for a variety of plant and animal species.

- In commercial thinning activities and prescribed fire, (particularly in mixed conifer PAGs) retention of the overstory; maintenance of LOS stand structure (be it fire-climax or climatic-climax); and retention of recommended levels of snags and down woody debris should allow treated stands to serve connectivity functions for many LOS associated species.

- In salvage and firewood activities (particularly in the lodgepole PAGs), retention of recommended levels of snags and down woody debris; limited or no treatment in riparian areas; no treatment of unique habitats such as lava pressure ridges; no treatment around sensitive plant locations; and maintenance of the green tree overstory component should allow treated stands to maintain some but not all of their habitat connectivity functions.

- In areas that are currently fragmented and thus present a "barrier" to LOS habitat connectivity, adopting an aggressive precommercial thinning program to accelerate development of LOS stands will facilitate meeting long-term habitat connectivity objectives.

Uneven-aged management in these MSAs has been recommended to connect mixed conifer habitats within the LSR. See MSAs for specific rationale. Refer to Figure 3-11.

Table 3 - 7, Uneven-aged Management in Lodgepole

Priority 1 MSAs	Priority 2 MSAs	Priority 3 MSAs
W	X	R, BB

Soil Restoration

The recommendations for soil restoration, e.g subsoiling, were based on information and figures in the Odell Pilot Watershed Analysis, Chapter II - Physical Domain. Refer to Figure 3-12.

Table 3 - 8, Soil Restoration

Priority 1 MSAs	Priority 2 MSAs	Priority 3 MSAs
K, Q, S, T, BB	C, E, F, R, U, W	D, G, H, L, M, W, Z

Management activities should minimize detrimental impacts to soils and/or should enhance soil productivity.

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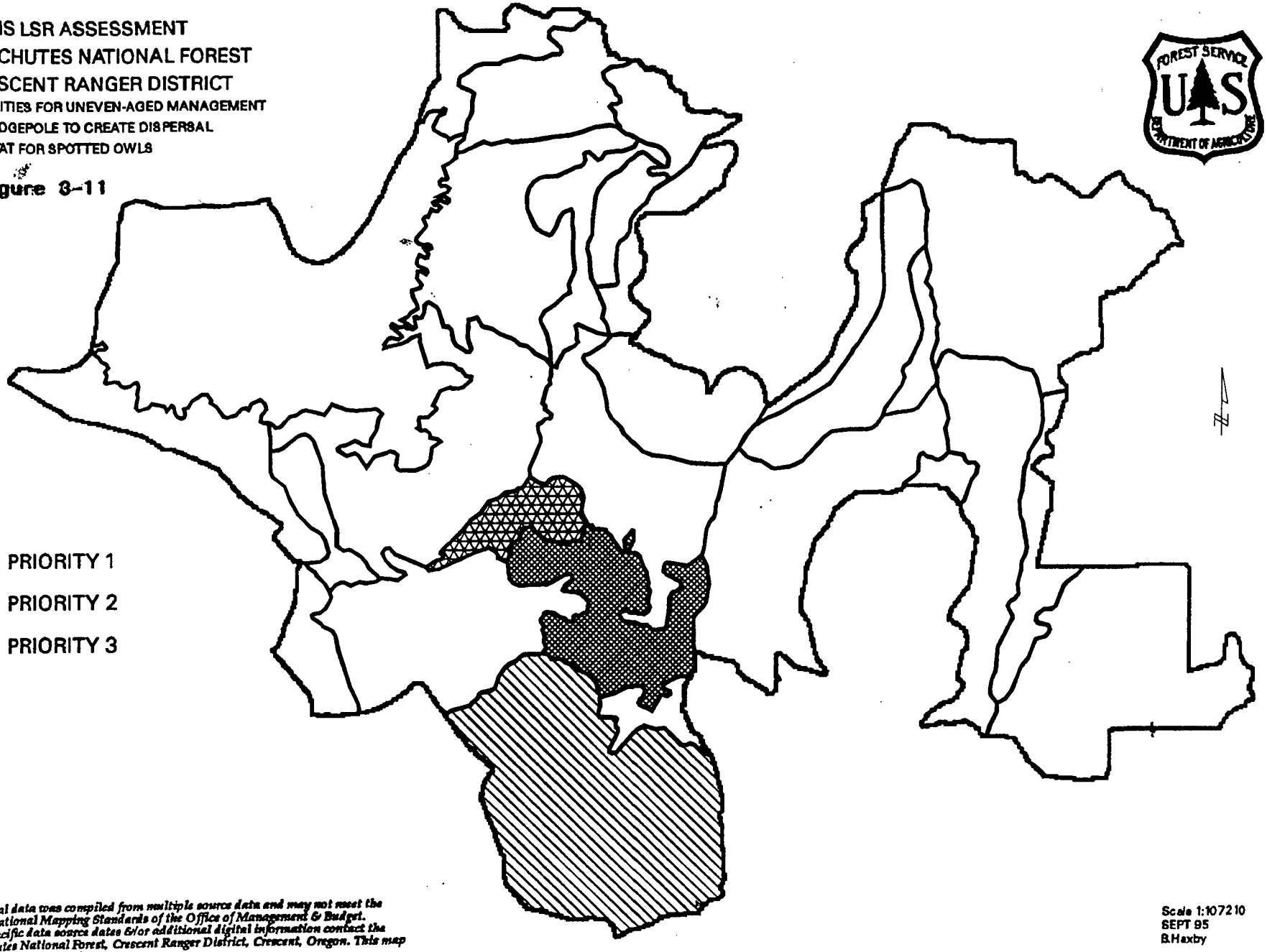
CRESCENT RANGER DISTRICT
PRIORITIES FOR UNEVEN-AGED MANAGEMENT
OF LODGEPOLE TO CREATE DISPERSAL
HABITAT FOR SPOTTED OWLS

Figure 3-11



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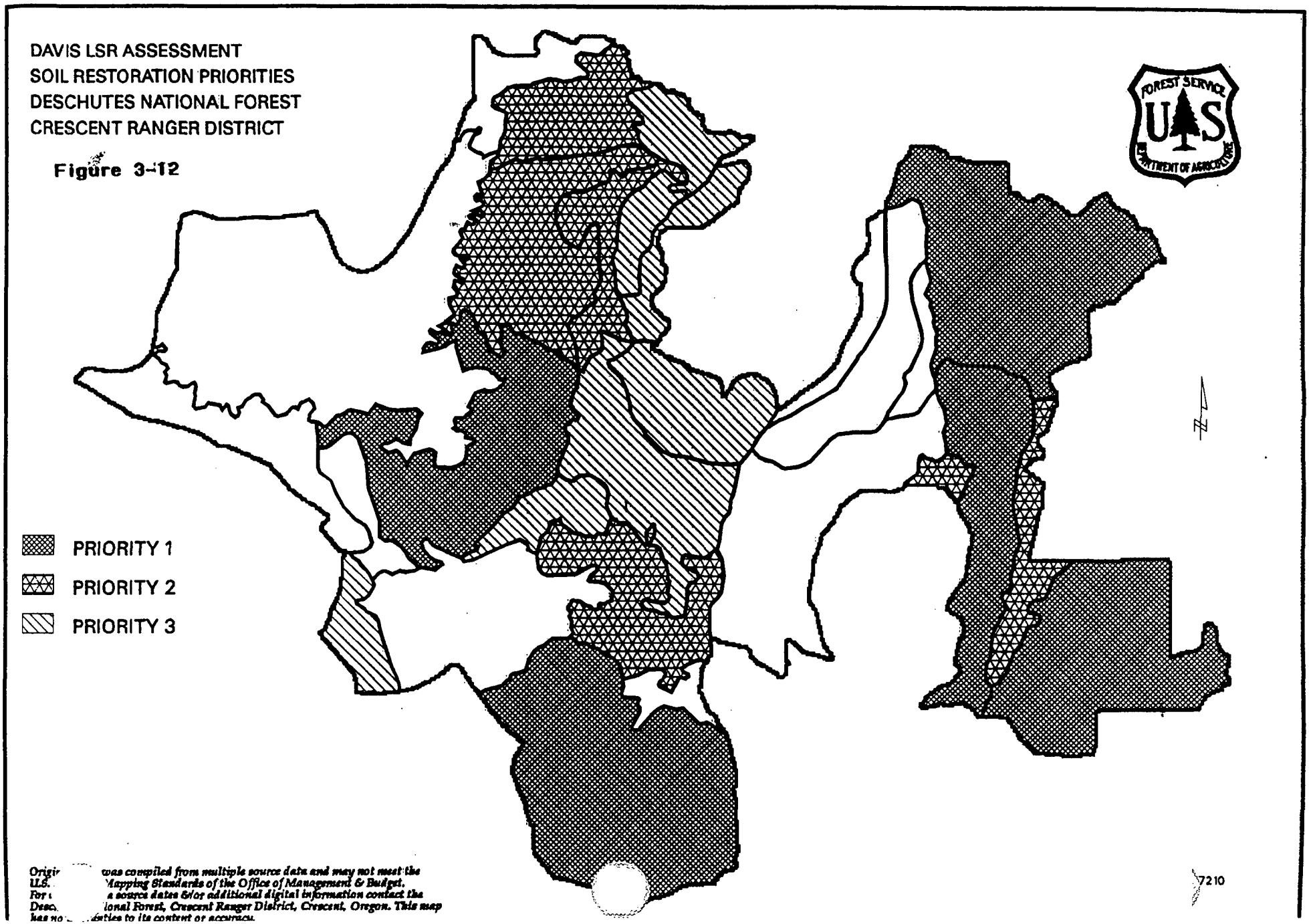

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Travel and Access Management

In general, the existing levels of access are not considered to be a major issue within the LSR. Where access is a concern, it will be discussed in the appropriate MSA(s). The following guidelines are designed to ensure that access does not become a major issue in the future:

-- Road construction in the LSR for silvicultural, salvage, and other activities is not recommended unless potential benefits exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept at a minimum, be routed through non-late successional habitat where possible, and designed to minimize adverse impacts. Alternative access methods, such as aerial logging, should be considered to provide access for activities in reserves. (NWFP C-16).

-- Road maintenance may include felling hazard trees along right-of-ways. Leaving material on site should be considered as an alternative. (NWFP C-16).

-- Road managment will be in compliance with all requirements specified in the Aquatic Conservation Strategy. Specific mitigations are identified in NWFP C-32 and 33.

-- Open road density in the LSR should be reduced to the minimal level needed to provide access for fire protection and administrative needs. The target open road density for roaded areas in the LSR is 1 mile/square mile.

The MSAs listed for travel and access management were selected based on the existing levels of roads and human uses and the perceived importance of the potential impacts of this structure and activity on LOS species. See individual MSAs for specific rationale. Refer to Figure 3-13.

Table 3 - 9, Access and Travel Management

Priority 1 MSAs
E, K, L, M, N, O, S, X, Z

Sensitive Plant Management

Priority 1 rankings were given to MSAs that had known MIJE occurrences and Priority 2 rankings were given to those MSAs where there was potential MIJE habitat based on plant association and elevation. Refer to Figure 3-14.

Table 3 - 10, MIJE Management

Priority 1 MSAs	Priority 2 MSAs
E, G, H, K, L, M, W, X, Z, BB	A, C, D, E, I, J, V, Y, AA

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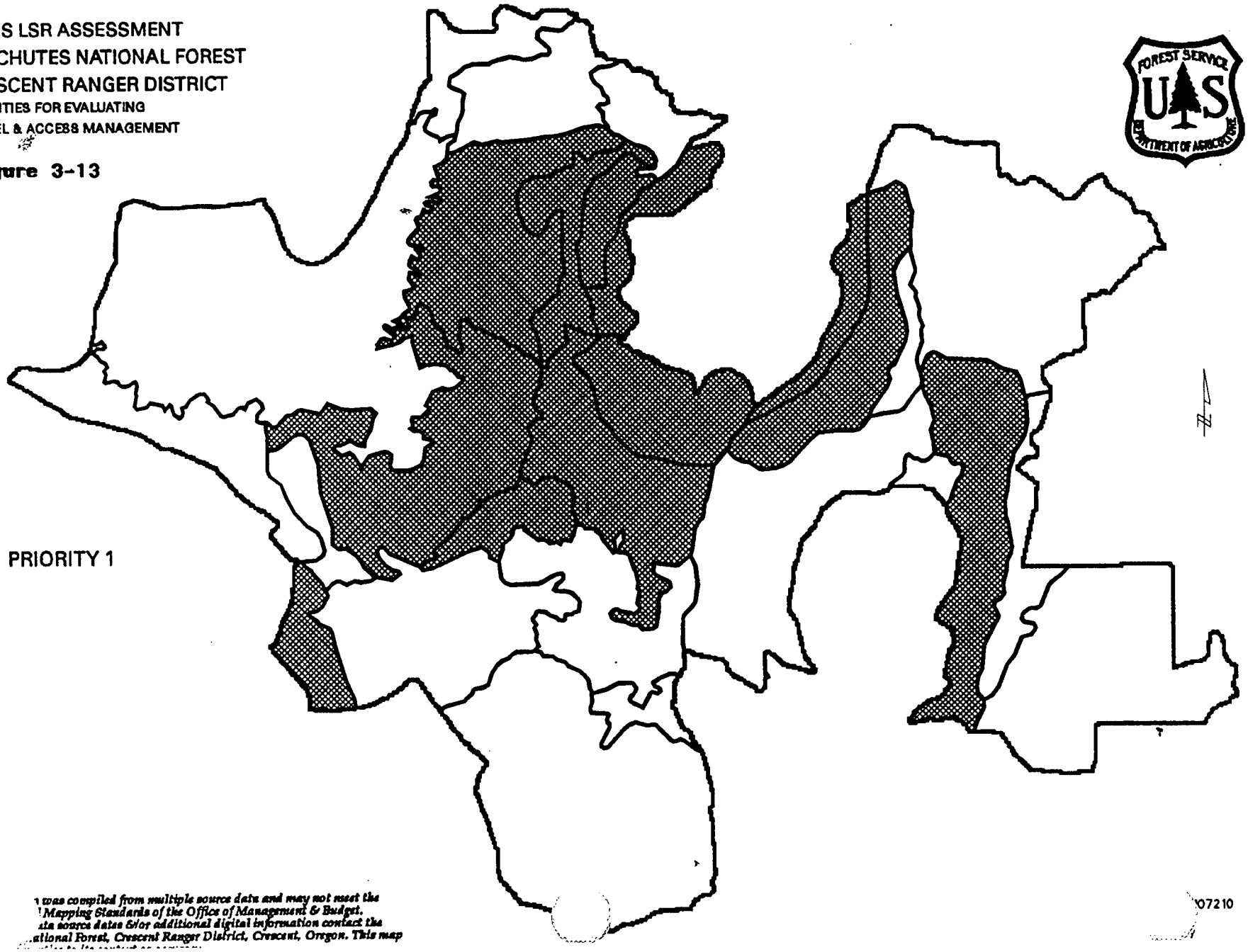
CRESCENT RANGER DISTRICT
PRIORITIES FOR EVALUATING
TRAVEL & ACCESS MANAGEMENT

Figure 3-13



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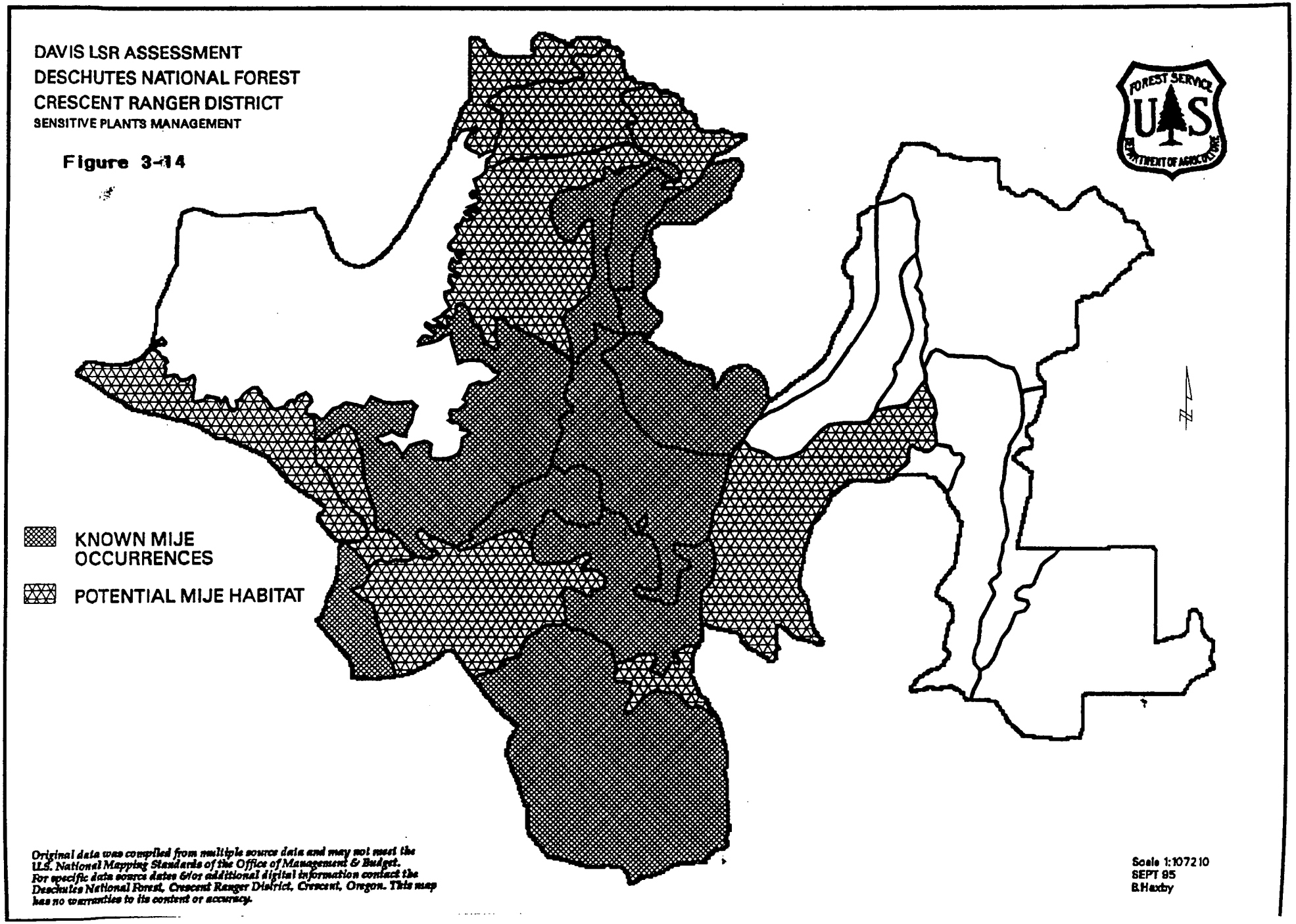
DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
SENSITIVE PLANTS MANAGEMENT
Figure 3-14
FOREST SERVICE
U S
DEPARTMENT OF AGRICULTURE
KNOWN MIJE OCCURRENCES
POTENTIAL MIJE HABITAT
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Noxious Weed Management

Priorities were assigned based on known sites for noxious weeds.

Prevent introduction of noxious weeds and other non-native species. Contain, control, or eradicate existing and newly discovered occurrences of noxious weeds and other non-native species using methods and strategies that are compatible with LSR objectives. (C-19) Refer to Figure 3-15.

Table 3 - 11, Noxious Weed Management

Priority 1 MSAs
J, N, O, Q, S, T, Z, AA

Prevent the introduction of new non-native wildlife species and seek opportunities to mitigate the impacts of existing non-natives on LOS associated species.

OTHER ACTIVITIES

Bryophyte, Lichen, and Mollusk Inventory

Priorities were assigned based on the plant association and the potential for existing bryophyte, lichen and mollusk habitat.

Conduct inventories for species listed in Appendix J2 according to the survey strategies as stated in the ROD (C-49-61) especially in areas where planned activities will be taking place. Refer to Figure 3-16.

Table 3 - 12, Bryophyte, Lichen, and Mollusk Inventory

Priority 1 MSAs
B, C, I, J, K, L, M, X, Y, Z, BB

Matsutake Mushroom Harvesting

The Special Forest Products section of the ROD (C-18) states "evaluate whether activities have adverse effects on LSR objectives... Where these activities are extensive (e.g. collection of... fungi), it will be appropriate to evaluate whether they have significant effects on late successional habitat. Restrictions may be appropriate in some cases."

At this time there is not enough information available to determine if commercial and personal matsutake mushroom collection would have a "significant effect on late successional habitat". Current research indicates that several important prey species of the northern spotted owl utilize a variety of fungi species in their diet (Cork and Kenagy 1989, Maser et al. 1985, Maser et al. 1978). Rosenter (1995) indicated that the primary prey species for the owl, the northern flying squirrel, utilizes fungi almost exclusively. Appendix J2-250 documents that matsutake mushrooms may be a mycobiont for one of the known J2 species in the LSR, *Allotropa virgata*.

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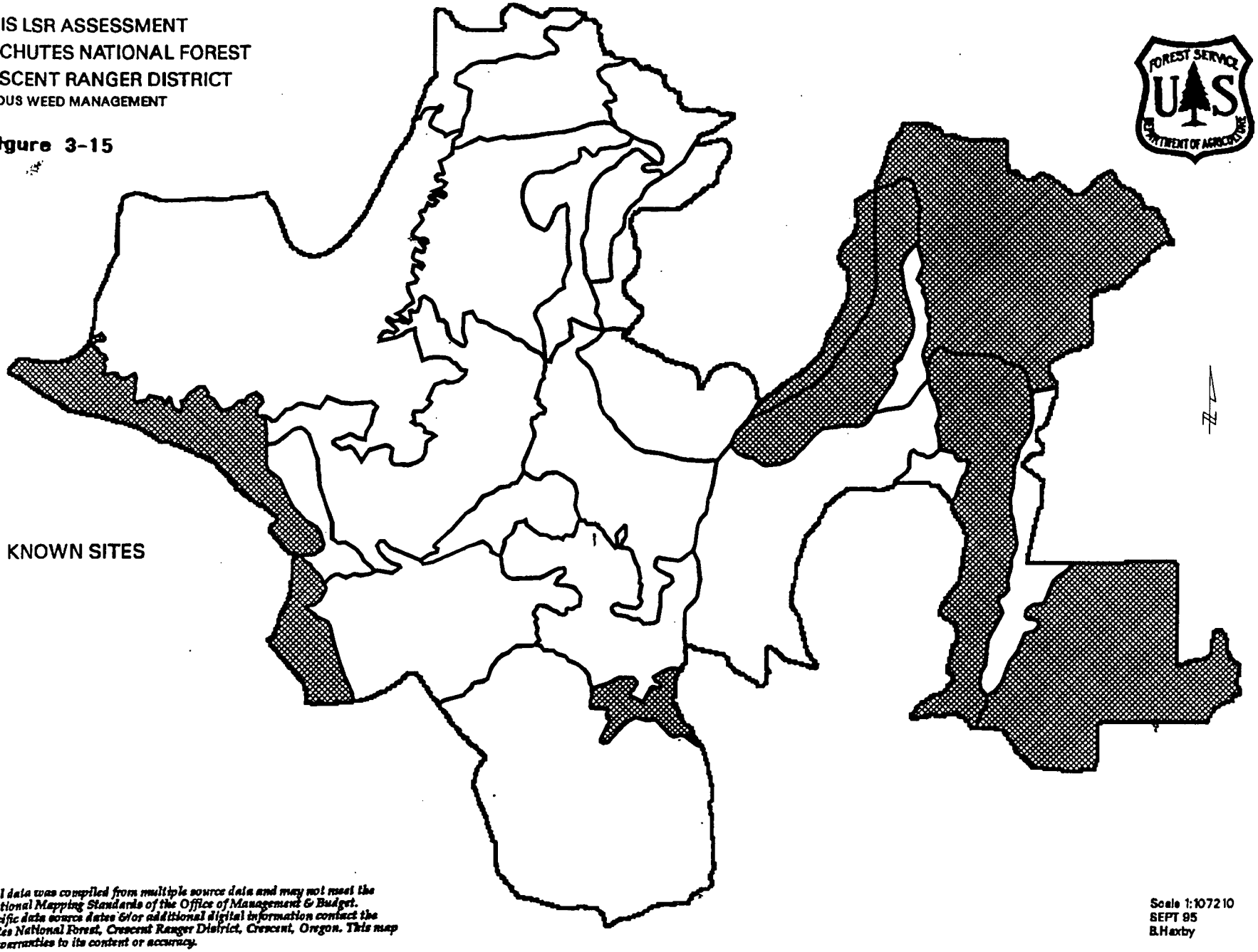
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT
NOXIOUS WEED MANAGEMENT

Figure 3-15



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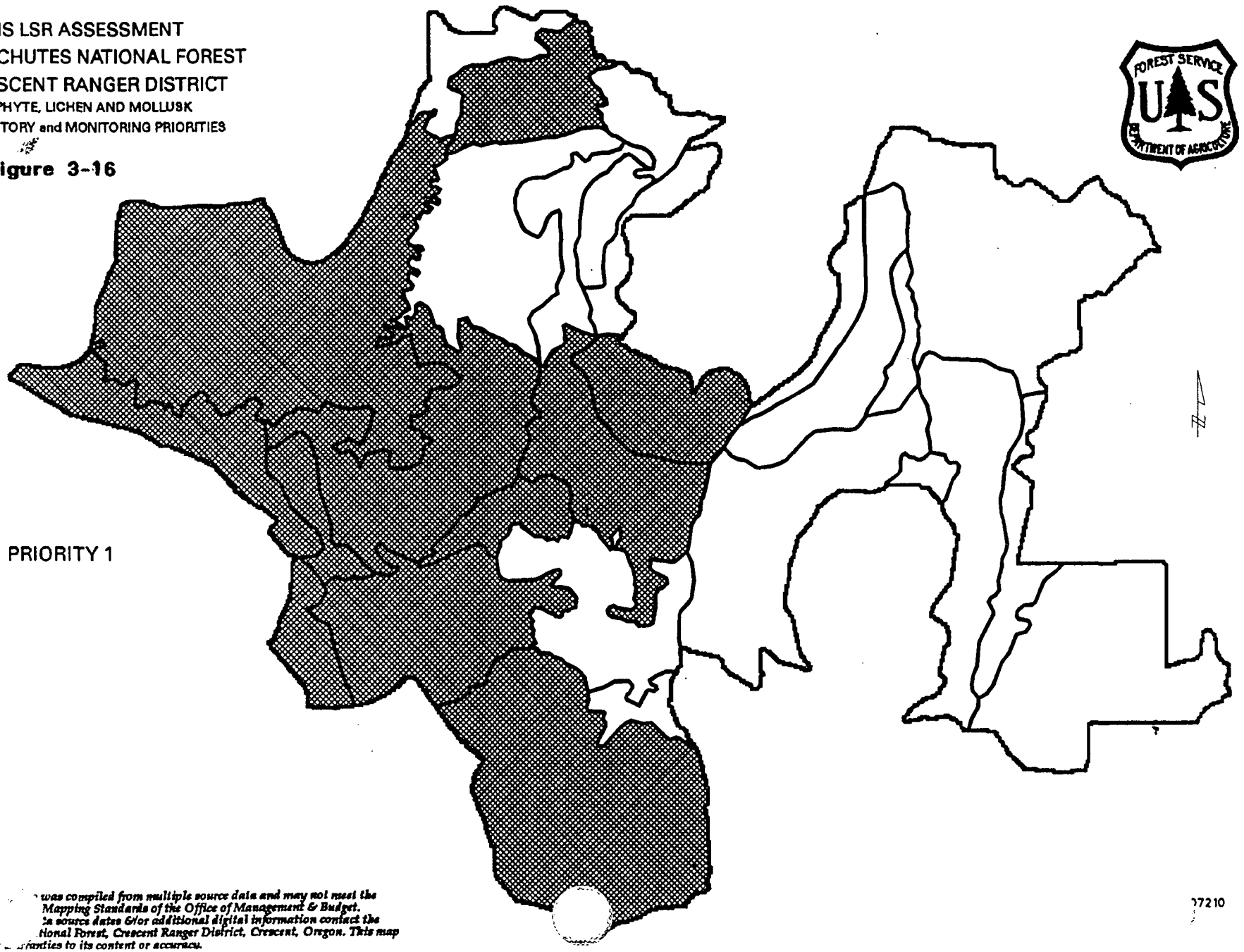
CRESCENT RANGER DISTRICT
BRYOPHYTE, LICHEN AND MOLLUSK
INVENTORY and MONITORING PRIORITIES

Figure 3-16



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Because existing research indicates a potential detrimental impact on LOS associated species, it is believed that this activity is not neutral or beneficial to LOS species or habitat. Consequently, the LSR team recommends that no commercial or personal matsutake mushroom collection should occur within the Davis LSR, since it is allocated as a reserve within the context of the larger landscape where such activities will continue.

Other Special Forest Products

Evaluate the appropriateness of other special forest products utilization on a site-specific basis to determine the consistency with the "protect and enhance" objectives of this LSR. (Examples of the intent of this management criteria: harvest of Christmas trees will generally be a neutral or beneficial impact in regenerated areas; collection of Prince's pine could have a potentially negative impact.)

Education

Actively seek opportunities to educate the public on the function and need for a LSR. Provide educational brochures, interpretive signs, and interactive presentations about the LSR to the public. Initially, focus efforts on activities that are proposed for additional restrictions or elimination in the LSR, fire prevention, and the role of fire in the Eastside ecosystems.

Rehabilitation and Restoration

All rehabilitation and restoration activities should focus on maintaining or enhancing LOS character following the guidelines in the Northwest Forest Plan and objectives for each MSA. Examples of beneficial rehabilitation and restoration activities include: 1) Recontouring hand or dozer line and covering it with debris to improve visual appearance, prevent water from channeling, and erosion from occurring; and 2) Scarify and revegetate the old snowmobile racetrack to reduce fragmentation and promote development of LOS character.

MONITORING, EVALUATION, and RESEARCH

The following is a list of recommended information gathering activities that should occur within all or portions of the LSR:

- Evaluation of stand conditions to determine if desired structural components and habitat function are being maintained in the MSAs. Establish a rotating schedule such that monitoring of all MSAs occurs every 3-5 years.

- Complete comprehensive Bald Eagle Management Plans for all of the BEMAs and BECAs in the LSR. The management plans for the Davis Lake BEMAs and BECAs are a higher priority than those for Odell Lake.

- Monitor matsutake mushroom harvesting to determine the effects on LOS habitat and dependent species.

- Determine if suitable habitat and known sites for the Survey and Manage species listed in Table C-3 exist.

CONSISTENCY WITH NORTHWEST FOREST PLAN

There are two primary differences between the Davis LSR and the majority of other LSRs in the reserve network within the range of the northern spotted owl. These differences include:

1. The majority of the area is occupied by a dry, mixed conifer forest; and

2. The Davis LSR is bisected by a large tract of lodgepole pine. Lodgepole pine does not have the biological potential to provide NRF habitat for spotted owls, thus, a discontinuity of optimal habitat for this species exists within the LSR. Lodgepole stands can be managed to provide dispersal and perhaps foraging habitat for the owl, and LOS lodgepole does support a host of other species.

These two items which make the Davis LSR unique, also make it vulnerable to catastrophic loss of the desired late and old-structured vegetative components due to wildfire, insects, and disease. Throughout this assessment process the LSR team struggled to obtain a balance between long-term habitat protection and short-term habitat degradation. The following habitat protection activities required interpretation of the intent of the ROD and may require confirmation of ROD consistency.

Identification of areas where salvage is appropriate. The LSR team believes that salvage recommendations meet the intent of guideline #5, ROD C-15.

Identification of areas where firewood cutting is appropriate. The LSR team believes that removal of limited quantities of down lodgepole from beetle-killed stands and on roads that are high fire risk meets the intent of habitat protection objectives. However, these recommendations do not seem to fall within the categories for fuelwood gathering identified in the ROD C-16.

Identification of areas where silvicultural activities such as thinning are appropriate. The LSR team believes that recommendations for silvicultural activities in the LSR meet standards and guidelines specified in the ROD C-12-13 for forests east of the Cascades.

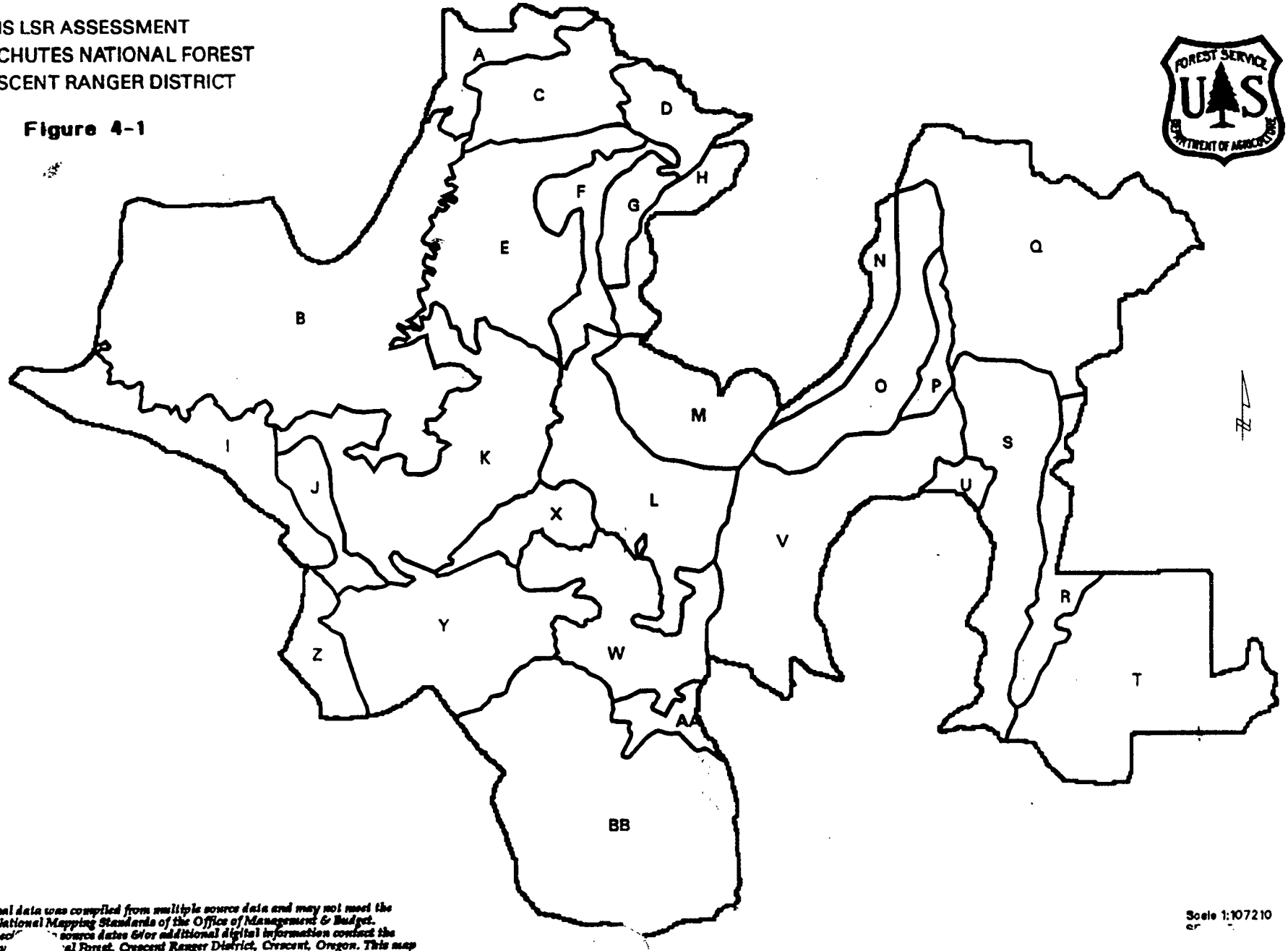
CHAPTER 4

MANAGEMENT STRATEGY AREAS

- EXISTING CONDITION
- CRITERIA FOR DEVELOPING APPROPRIATE TREATMENTS
- MANAGEMENT OPTIONS
- MONITORING, RESEARCH, & EVALUATION

DAVIS LSR ASSESSMENT
DESCHUTES NATIONAL FOREST
CRESCENT RANGER DISTRICT

Figure 4-1



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Introduction

Chapter 3 sets the overall context for management within the LSR. This chapter expands on the overview information and applies it to the individual management strategy areas (MSAs) as appropriate. There are twenty-eight MSAs delineated within this 48,890 acre LSR. For each MSA, the existing condition for wildlife, botany, invertebrates, forest dynamics, fire, and social context has been documented. The desired condition, objective, management options for the short and long-term, and monitoring and evaluation elements have also been identified and documented for each MSA.

Criteria for Developing Appropriate Treatments

This document is an interpretation of the Northwest Forest Plan. Additional management criteria are included in the NWFP that have not been reiterated in this assessment. All activities occurring within the Davis LSR need to be consistent with the applicable NWFP Standards and Guidelines.

The desired condition, objective, and management options are the LSR team's recommendations based on intent of the NWFP and the level of information available on the LSR's existing condition. These recommendations were made for each individual MSA in context with the LSR as a whole. For example, recommendations for treatment may be more conservative in MSA - V as compared to MSA - Q based on the existing condition and function of habitat.

These recommendations are not NEPA decisions. Site-specific analysis is needed before any management options can be implemented and may provide additional information on the existing condition which could modify which management options would be implemented. Specific treatment objectives would be selected by the project level interdisciplinary teams and would need to consider the context of the proposed teatment within the LSR and the landscape as a whole. The management options and treatment scenarios (Chapter 3) included in this assessment are the team's recommendation as to how to meet or move towards the objective and desired condition.

Key Definitions

Catastrophic levels of habitat loss -- Within the sideboards of the ROD, 100s or 1000s of acres, a catastrophic level of habitat loss occurs when the MSA loses its ability to function as habitat for the emphasis species.

Emphasis species -- Species or species groups and their associated habitats selected to provide a means of focusing and prioritizing areas within the LSR for protection and enhancement activities. These species include: northern spotted owl, pileated woodpecker, northern goshawk, black-backed woodpecker, great gray owl, flammulated owl, white-headed woodpecker, northern bald eagle, osprey, wolverine, marten, fisher, elk, amphibians, and neotropical migratory birds. These emphasis species were selected because they utilize and represent a broad spectrum of habitat types in the various plant association groups (PAGs).

Imminently susceptible -- A situation where the conditions are such that it is very likely there will be significant change in structure or character of forest stands on a large scale as a result of insect attack and/or fire within the next 10 years.

NRF -- Nesting, roosting, and foraging habitat for the northern spotted owl. NRF habitat for the northern spotted owl on the Deschutes National Forest is comprised of stands of mixed conifer, ponderosa pine

with a major component of white fir understory, mountain hemlock with sub-alpine fir with an average 75 percentage of canopy cover, 22 large diameter trees per acre (25" or greater DBH), approximately 280 trees per acre of second canopy layer, 12 hard snags (> 15" dbh) per acre, and 15 down logs (>15" dbh) per acre (Gerdes 1992). Habitat characteristics were developed from vegetative survey plots on six reproductive northern spotted owl pair sites on the Deschutes National Forest. The percentage of NRF habitat is listed in each applicable MSA. At times the percentage of NRF and LOS seem inconsistent, this is due to: 1) the designation of NRF based on known habitat utilization and 2) differences in computer modeling of NRF and LOS.

Take -- In this document TAKE refers to the criteria defined by the US Fish and Wildlife Service that addresses the removal or degradation of spotted owl nesting, roosting, and foraging habitat. "Take" occurs when a spotted owl's home range radius contains less than 40% nesting, roosting, and foraging habitat.

Treatment -- This term is used in numerous management options and describes varying degrees of activity ranging from minor stand management to large-scale activities.

MSA A

MANAGEMENT STRATEGY AREA - A

Existing Condition

Wildlife

Emphasis Species -- Black-blacked Woodpecker

The MSA is existing and potential habitat for black-backed woodpeckers. Salvage of beetle-killed lodgepole is proposed on approximately 1,600 acres north of and adjacent to the MSA. Consequently, habitat effectiveness for black-backed woodpeckers will be reduced short-term in this area, however, risk-reduction and protection for the LSR will also be accomplished from this activity.

Moore Creek, an ephemeral stream, provides habitat for amphibian dispersal and genetic exchange with westside populations.

Selected Other Species

- Spotted owl - The MSA falls almost entirely within the home range radius of a known owl activity center. Within this MSA 182 acres or 24% is currently NRF habitat.
- Northern goshawk - The MSA is within the home range territory of a goshawk.
- Marten

Fragmentation

Fragmentation of the habitat is minimal. Only 7% of the area is fragmented from past harvest activities and, in addition, road density is very low.

Late and Old Structured Stands

Currently within the MSA 612 acres or 80% exists as LOS. The LOS is primarily located within the lodgepole PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	81
LDMH	3
LPH	470
LW	13
MCD Early	32
MCD Late	13
TOTAL	612

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- Refer to the Botanical section for additional information.

Fungi -- Potential habitat for fungi species listed in these PAGs: Lodgepole High Elevation, Lodgepole Dry, and Mixed Conifer Dry.

Bryophytes -- Moore Creek may provide potential habitat for the listed bryophytes.

Lichens -- The riparian area along Moore Creek that runs through LOS may have potential habitat for the lichen species listed.

Vascular Plants -- MSA - A has potential habitat for Candy Stick (*Allotropa virgata*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - A. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- Refer to the Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed species in MSA - A.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	2%
Mixed Conifer Dry	17%
Lodgepole High Elevation	66%
Lodgepole Pine Dry	11%
Lodgepole Pine Moist/Wet	2%
Mountain Hemlock	2%
Other Incidental PAGs	<1%

Summary of Trends

- The lodgepole pine areas have had little extensive management activity. This trend is expected to continue into the foreseeable future.

•Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
•Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 7% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.
•Approximately 24% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* – Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* – Salvaged areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in all lodgepole PAGs and high severity in the mountain hemlock PAG.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area. A total of three fires have occurred in this MSA between 1940 and 1994, all three were lightning-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - A functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - A in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR; and MSA - A is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - A there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are also allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information is based on the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - A, EXISTING CONDITION

MSA - A

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Lodgepole Wet, and Mountain Hemlock

Total Acres -- 769

Elevation Range -- 4,800 - 5,200

Land Allocation -- Dispersed Recreation, General Forest, Scenic Views - PR/MG, Scenic Views - FG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Black-backed Woodpecker, Amphibians, northern spotted owl, northern goshawk, marten

Botanical -- Potential habitat for *Allotropa virgata*

Fragmentation (%) -- Regenerated Areas - 7%, Road Density - very low

LOS (%) -- 80%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 3 (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- Low (2)

Activities -- Matsutake mushroom known picking site, Moore Creek Trail (hiking/biking), Metolius-Windigo Horse Trail, hunting

Commodities -- Commercial mushroom harvesting, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a sustainable LOS forest ecosystem through time that supports the diverse species associated with this MSA. Manage to provide and maintain a healthy riparian system according to the Aquatic Conservation Strategy and to provide a viable LOS lodgepole pine component through time.

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-30 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.

  Rationale: The existing condition of the MSA provides suitable habitat for emphasis and other selected species. Since decadent stands provide optimal habitat for black-backed woodpeckers, and salvage is occurring adjacent to the LSR which provides some fire protection, the team felt that risk reduction management was not currently needed in this MSA.

- Maintain a LOS lodgepole ecosystem. (Short and Long-term)

Long-term (30+ years) --

- Provide suitable LOS habitat in this MSA through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3. Manage stands in the mixed conifer PAGs to provide suitable NRF habitat conditions.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable in the short-term, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within the home range radius of the spotted owls is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: This MSA currently has a large percentage of LOS and minimal fragmentation which allow it to function as suitable habitat for a variety of emphasis and select species. Due to these factors further degradation of habitat is undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would decrease the suitability of the habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐It is recommended that natural processes be allowed to continue in forested areas utilizing only fire suppression as a protection method for this MSA. (Short-term)

Rationale: Salvage in Unclaimed Lavas will reduce habitat effectiveness for black-backed woodpeckers on a large area adjacent to the MSA. Salvage will also provide risk reduction via fuel hazard reduction adjacent to a known owl pair in MSA - C and adjacent to a resident single owl just north of the LSR. Additionally, most of the MSA is LOS and is located almost entirely within the owl home range radius.

☐If the desired structural components are being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Allow the normal cycling of lodgepole pine to proceed with the objective of providing optimal habitat for emphasis species. Normal cycling, including beetle infestations and mistletoe, will create habitat for the black-backed woodpecker. (Long-term)

☐Develop a diversity of vegetative structures across the landscape to enhance resistance to and resiliency from stand disturbing agents in mixed conifer PAGs. (Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Monitoring, Evaluation, and Research

■Conduct goshawk surveys to determine the locations of nesting and roosting sites.

■Conduct surveys to confirm the presence and/or habitat utilization of black-backed woodpeckers and marten.

MSA B

MANAGEMENT STRATEGY AREA - B

Existing Condition

Wildlife

Emphasis Species -- Wolverine

There are documented sightings of wolverine in this MSA. The area historically provided year-round habitat and travelways for this species and may currently still do so. Winter recreation may be the greatest impact to habitat effectiveness for the wolverine.

Selected Other Species

- At lower elevations the MSA provides habitat for other forest carnivores such as fisher, marten, and weasels.
- Black-backed woodpeckers, three-toed woodpeckers, and other cavity nesters utilize the MSA for both nesting and foraging.
- High elevation lakes and drainages provide habitat and dispersal corridors for amphibians.
- Northern spotted owl - 1,451 acres or 22% of the MSA is NRF habitat and provides an important eastside/westside dispersal habitat link for genetic exchange.

Fragmentation

No roads or past harvest activities fragment this MSA. The only fragmentation of LOS results from openings created by laminated root rot pockets which occur on approximately 15-20% of the MSA.

Late and Old Structured Stands

Currently within the MSA 6,071 acres or 94% exists as LOS. The LOS is primarily located within the lodgepole dry/mountain hemlock and mountain hemlock PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	41
LDMH	1,955
LPH	51
MH	4,024
TOTAL	6,071

Snags and Down Woody Debris

The existing levels of snags and down woody debris are consistent with the levels identified as providing suitable LOS habitat (Chapter 3).

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for fungi species in MSA - B is listed by PAG: Mountain Hemlock, and Lodgepole Dry/Mountain Hemlock.

Bryophytes -- Streams, springs, and seeps may provide habitat in MSA - B for the listed bryophytes.

Lichens -- The riparian areas that run through LOS in MSA - B may have potential habitat for listed lichen species.

Vascular Plants -- MSA - B has suitable habitat, as well as a known site, for Candy Stick (*Allotropa virgata*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - B. There is potential for noxious weeds along trails and at trailheads.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Potential habitat in streams, springs, and seeps for listed species in MSA - B.

Arthropods -- Survey strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Lodgepole Pine High Elevation	1%
Lodgepole Dry/Mountain Hemlock	32%
Lodgepole Pine Dry	1%
Mountain Hemlock	65%
Other Incidental PAGs	1%

Summary of Trends

- These stands are approximately in the middle of their seral development.
- Forested stands are moving towards later seral stages except where root rot has moved stands containing mountain hemlock towards earlier seral stages.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as root rot pockets develop multiple layers over time.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing at a slow rate.
- These stands are very stable and have a 600-1200 year cycle of stand replacement events.
- White pine blister rust is seriously reducing/eliminating western white pine viability as an invading species in the root rot pockets.
- As discussed in the Odell Watershed Analysis, these stands seem to be functioning with little or no influence by man other than the white pine blister rust.

Harvest Areas

At present, no portion of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Stands are in the late/old seral/structural stages.
- Approximately 22% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

- *Regenerated Areas* -- Canopy is diverse in stocking level and structure. Only in the outer edges of the root rot pockets is the canopy open allowing development of forage and shade intolerant ground vegetation and tree species. The interior portions of the root rot pockets are heavily stocked with lodgepole pine, western white pine, the majority of which is infected with blister rust, and hemlock regeneration.

- *Harvested Areas* -- There are no harvested areas in this MSA.

Fire

Historic Fire Regime -- Moderate to high severity in all lodgepole PAGs and high severity in the mountain hemlock PAG.

Hazard Analysis -- Moderate

Fire suppression over the years has contributed to the fuels condition that will lead to a stand replacing event with the right weather conditions.

Risk Analysis -- High

Significant lightning and, to a lesser extent, human-caused ignitions have occurred within this area. A total of thirty-seven fires have occurred in this MSA between 1940 and 1994, twenty-five were lightning-caused, and twelve were human-caused. The potential for future ignitions may be magnified due to the tracking weather patterns over the area and increased human use. The tracking or predominant weather pattern over this area is from southeast to northwest.

Social Context

Reference to Odell WA

To understand how MSA - B functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - B in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - B is included as part of the "High Cascade Crest" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

MSA - B is located in a roadless area. There are trails throughout the area including the Pacific Crest Trail. Motorized vehicles are prohibited on all trails. Snowmobiles, bikes, and other mechanized wheel vehicles are allowed on designated routes. Cross-country skiing is allowed everywhere, and horses are allowed everywhere outside the closed areas. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - B, EXISTING CONDITION

MSA - B

PAG(s) -- Mixed Conifer Wet, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Ponderosa, and Mountain Hemlock

Total Acres -- 6,492

Elevation Range -- 4,800 - 5,200

Land Allocation -- Dispersed Recreation, BEMA, Scenic Views - PR/MG

Landscape Area(s) -- Mountain Hemlock (Odell WA)

Wildlife -- Wolverine, fisher, marten, weasels, black-backed woodpecker, three-toed woodpecker, other cavity nesters, amphibians, northern spotted owl

Botanical -- Known ALVI site

Fragmentation (%) -- Regenerated Areas - none, fragmentation from laminated root rot pockets (15-20% of MSA), Road Density - N/A

LOS (%) -- 94%

Insect and Disease Risk -- Moderate

Forest Density -- Moderate

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- High

Fire Hazard -- Moderate

Access -- Low - roadless area (7 and some 2)

Activities -- Recreation Trails: Moore Creek, Maiden Lake, Maiden Peak, Pacific Crest Trail (Rosary Lakes)

Commodities -- Special forest products (Prince's pine)

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain the pristine quality of this area and suitable LOS habitat condition as described in Chapter 3. Refer to the Goals and Objectives listed for the Mountain Hemlock Association Landscape Area in the Odell Pilot Watershed Analysis.

Objective

Emphasize and enhance habitat for native and naturalized terrestrial and aquatic biota. Natural processes are the dominant features that shape the landscape and include fire and development of root rot pockets.

Maintain 70% of the MSA in suitable climatic-climax habitat for emphasis and selected species.

Management Options

Vegetative Management

☐No silvicultural treatments are appropriate in this MSA unless a catastrophic event such as a fire or insect epidemic began to or had already occurred. All vegetative treatments would be compatible with the standards and guidelines for dispersed recreation management areas (LRMP MA 12) and with LSR objectives. (Short and Long-term)

Rationale: As discussed in the Odell Watershed Analysis, this MSA seems to be functioning with little or no influence by man other than the white pine blister rust. Hence, no need for vegetative manipulation is warranted at this time other than reintroduction of rust-resistant western white pine.

☐Maintain a viable blister rust resistant western white pine component in the ecosystem for vegetative species diversity in root rot pockets. (Short and Long-term)

Opportunity -- Plant resistant strains of western white pine to counteract white pine blister rust. Monitor -- Survival of rust resistant western white pine seedlings planted in the spring of 1995. Evaluate the rust resistance of the outplanted seedlings over time. Determine which species use or depend on the white pine trees.

☐Maintain meadows from encroachment as needed. (Short and Long-term)

Fire Suppression

☐A fire plan should be developed for this landscape area and should evaluate moving from a control to a confine and/or contain strategy that would allow fire to play a more natural role in helping to maintain sustainable processes. Devlopment of a fire plan should include discussion and analysis of managed fires regardless of ignition source. Until a prescribed natural fire plan is written for this area or a larger area encompassing this MSA, then use appropriate confine, contain, and control strategies with the emphasis being placed on confine and contain. Control strategies may be needed if a fire was nearing MSA - C and/or K. (Short-term)

☐Manage fire events at their natural rates and intensities to facilitate minimal stand replacement events. (Short and Long-term)

Opportunity -- Use prescribed natural fire, wildfire monitoring, and/or other techniques to retain appropriate levels of fire activity which maintain historic functions and processes across the landscape and within this MSA.
Monitor -- Evaluate the fire frequencies and the possibilities for using prescribed fire to protect and enhance the ecosystem processes in this area.
Monitor -- Set up an air quality monitoring station on Maiden Peak.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 in the Northwest Forest Plan.
Monitor -- Conduct surveys for and monitor known *Allotropa virgata* populations.

☐Maintain or enhance habitat for wildlife species such as the wolverine, fisher and marten.

☐Evaluate removal of non-native fish species that become, or currently are, a hinderance to successful exchange of genetic material across the Cascade Crest for amphibians.
Monitor -- Conduct amphibian surveys.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access, including trails, unless monitoring determines that current levels are a deterrent to use of the habitat by forest carnivores such as fisher and wolverine or other LOS plant or animal species.
Monitor -- Evaluate use of the MSA by forest carnivores.

☐Allow winter mechanized access on designated trails which minimize disturbance to other users and wildlife. No new trails should be constructed unless the purpose of new construction is to replace an existing trail or use that is detrimentally impacting LOS or riparian habitats. Provide for summer mechanized access (mountain bikes only) on designated trails which are appropriately designed and constructed and will minimize disturbance to wildlife.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization of neotropical migrants and black-backed woodpeckers.

■Survey for presence of forest carnivores, primarily fisher and wolverine. If presence is confirmed, initiate a habitat utilization study and an evaluation of human use on this utilization.

C
MSA C

MANAGEMENT STRATEGY AREA - C

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. The entire MSA is within the home range radius of the owl pair. Documentation of owl use in the area exists from 1989-1995. The area is important for this species, because it constitutes a link for dispersal and genetic exchange between the Davis and Cultus LSRs. Within the MSA 680 acres or 54% is in NRF habitat. Most of the forested areas in the MSA are currently NRF habitat, and all of the regenerated areas are considered potential NRF habitat. The owls are not in the "take" category at the 0.7 mile radius with 52% NRF, but are considered to be "take" at the 1.2 mile radius with 31% NRF.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Potential fisher habitat and travel corridor
- Moore Creek contains potential habitat for bats, neotropical migratory birds, amphibians, and Preble's shrew.

Fragmentation

Currently within the MSA 27% exists as regenerated areas. Heavy fragmentation of the old growth forest has reduced the habitat effectiveness of the MSA for spotted owls and other interior species. Owls are vulnerable to both predators and competitors as a result of fragmentation. Road density is low, and the impacts from road fragmentation are minimal.

Late and Old Structured Stands

Within the MSA 485 acres or 38% exists as LOS and is primarily in the late seral mixed conifer dry PAG. An Old Growth Management Area is also located within this MSA and constitutes 299 acres. Not all of the acreage within the Old Growth MA is considered LOS at this time.

ACRES OF LOS BY PAG

PAG	Acres
LD	2
LDMH	2
LPH	94
LMW	12
MCD Late	375
TOTAL	485

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (Chapter 3). The levels within the forested areas, however, are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species in MSA - C occurs in these PAGs: Lodgepole High Elevation, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- Potential habitat exists for listed bryophyte species along Moore Creek.

Lichens -- MSA - C has potential habitat for listed lichens along Moore Creek.

Vascular Plants -- MSA - C has known sites for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - C. There is potential habitat for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Potential habitat for listed mollusks in Moore Creek.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	8%
Mixed Conifer Dry	82%
Lodgepole Pine High Elevation	8%
Lodgepole Pine Moist/Wet	1%
Other Incidental PAGs	1%

Summary of Trends

- The lodgepole pine areas have had very little extensive management activity. This trend is expected to continue.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.

•Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
•The mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 27% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered mixed conifer stands are in the late/old seral/structural stages.
•Approximately 54% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Since most of the harvested areas received regeneration cuts, see the regeneration information above.

Fire

Historic Fire Regime -- Moderate to high severity in all PAGs located in this MSA.

Hazard Analysis -- High

Fire suppression over the years has contributed to the fuels condition that will lead to a stand replacing event with the right weather conditions.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area. A total of six fires have occurred in this MSA between 1940 and 1994, five were lightning-caused, and one was human-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continued build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - C functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - C in terms of social expectations; human settlements influencing the MSA; the

history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - C is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - C there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles and bikes or other mechanized wheel vehicles are also allowed everywhere. Cross-country skiing is allowed everywhere, as well as horses. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - C, EXISTING CONDITION

MSA - C

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, and Ponderosa

Total Acres -- 1,270

Elevation Range -- 4,500 - 5,000

Land Allocation -- General Forest, Old Growth, Scenic Views - PR/MG, Scenic Views - FG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Northern Spotted Owl, northern goshawk, pileated woodpecker, fisher, bats, NTMB's, amphibians, Preble's shrew

Botanical -- Known *Allotropa virgata* and mountain ladyslipper sites, matsutake mushroom

Fragmentation (%) -- Regenerated Areas - 27%, Road Density - low fragmentation

LOS (%) -- 38%, primarily in late seral MCD. Old Growth MA.

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 (Odell WA)

Fire Risk -- Low

Fire Hazard -- High

Access -- Moderate (2)

Activities -- Snowmobile trail traverses area, matsutake mushroom known picking site, hunting, big trees, driving for pleasure

Commodities -- Commercial mushroom harvesting, wood products, special forest products

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would decrease the suitability of the habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

Long-term (50+ years) --

- Maintain a minimum of 40% of the MSA in suitable LOS-climatic-climax habitat for emphasis and selected species.

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within the home range radius of the spotted owl is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would decrease the suitability of the habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastophic levels, treat according to the guidelines listed in Chapter 3 for the multistory treatment scenarios. The purpose of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.
Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of spotted owl activity. Monitor presence and reproductive success.

■Conduct surveys to confirm the presence and/or habitat utilization of amphibians, bats, and Preble's shrews.

■Conduct surveys for bats. Monitor use of bat boxes installed under bridges and in other suitable locations. Initiate a study to determine the presence of maternity colonies, winter hibernacula, and roost site characteristics.

■Conduct winter tract surveys to monitor marten use of slash piles.

MSA D

MANAGEMENT STRATEGY AREA - D

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

Approximately 50% of the MSA is located within the Davis Lake West BECA. The MSA contains existing and potential eagle nest, forage, and/or perch sites. Although no mixed conifer or ponderosa sites occur in the BECA, lava-pressure ridges support large ponderosa pine trees within lodgepole PAGs. Eagle use has been documented in the area from 1973-1995.

The ephemeral Moore Creek winds in and out of the northern portion of the MSA. Salvage of beetle-killed lodgepole is proposed on approximately 1,600 acres north of and adjacent to this MSA.

Selected Other Species

- The area provides habitat for the black-backed woodpecker, marten, osprey, and numerous cavity nesters.
- Great Blue Heron - A rookery exists approximately 0.5 miles north of the MSA boundary, indicating that this MSA is potential habitat for great blue herons.
- Moore Creek provides potential habitat for Preble's shrews.

Fragmentation

The MSA is heavily fragmented (33%) from past harvest activities. Large clearcuts have limited available nest and forage perches for osprey, eagle, great blue herons, and forest accipiters. The road density is low and potential impacts are minimal.

Late and Old Structured Stands

Currently within the MSA 431 acres or 64% exists as LOS. The LOS is located within the lodgepole PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	284
LW	147
TOTAL	431

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species exists for these PAGs: Lodgepole Dry, Mixed Conifer Wet, Mixed Conifer Dry, and Ponderosa Pine.

Bryophytes -- There is low potential for habitat for listed bryophytes in MSA - D.

Lichens -- This MSA has low potential for habitat for listed lichens.

Vascular Plants -- MSA - D has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - D. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed mollusks.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	1%
Mixed Conifer Dry	1%
Lodgepole Pine Dry	61%
Lodgepole Pine Moist/Wet	26%
Ponderosa Pine Dry/Wet	11%

Summary of Trends

- The lodgepole pine areas have had extensive management activity and, because of beetle activity, it is expected that management activity will be needed into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the ponderosa stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine to the point that much of the overstory is at risk of being lost to insects or stress.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.

•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 33% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Salvaged areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in all lodgepole and mixed conifer PAGs and low severity in the ponderosa pine PAG.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area since 1940. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - D functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - D in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six

areas also apply to Davis LSR; and MSA - D is included as part of the "LaPine Basin" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - D there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are also allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information is based on the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - D, EXISTING CONDITION

MSA - D

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole Dry, Lodgepole Wet, and Ponderosa

Total Acres -- 675

Elevation Range -- 4,400 - 4,600

Land Allocation -- BECA, Scenic Views - R/MG, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Bald Eagle, black-backed woodpecker, marten, osprey, cavity nesters, great blue heron, Preble's shrew

Botanical -- Potential ALVI and CYMO site.

Fragmentation (%) -- Regenerated Areas - 33%, Road Density - low fragmentation

LOS (%) -- 64%, primarily in the lodgepole PAG

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 4 (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- Low (2) and (7)

Activities -- Snowmobile trail along southern boundary, hunting

Commodities -- Wood products

Additional Information -- Moore Creek is located along the edge of the MSA.

Criteria for Developing Appropriate Treatments

Desired Condition

In stands that have the site potential, manage to obtain or move towards the conditions for suitable ponderosa pine fire-climax and the description below. Maintain an overstory of ponderosa pine and Douglas-fir which meets the following characteristics: 1) Dominant or codominant trees are >35 inches in dbh, have a limb structure that will support a nest, and provide a view of the primary foraging area; and 2) Stand size, density, and canopy closure are sufficient to provide a visual buffer from human disturbance and protection from nest and nest tree blowdown (Anthony and Isaacs 1989). In addition, suitable replacement trees are developing in the stand.

In the remaining stands, provide a viable LOS lodgepole pine component.

Objective

Manage to provide abundant nest, roost, and perch sites for eagles, osprey, great blue herons, and other species with similar habitat needs in the BECA portion of the MSA. Manage the remaining portions of the MSA for LOS lodgepole to provide black-backed woodpecker and marten habitat.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. Reducing fragmentation is a high priority. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management outside the BECA is as follows: No silvicultural treatments are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at a catastrophic level. (Short-term)

Rationale: No vegetative management is recommended in the short-term outside the BECA due to the heavy fragmentation and large-scale salvage harvesting that will occur adjacent to the MSA.

☐If the desired structural components are in imminent risk of being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the single-story treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐Inside the BECA utilize silvicultural treatments to protect and enhance the ponderosa pine component. (Short and Long-term)

Rationale: This management activity will perpetuate ponderosa pine by saving the overstory and enhancing the understory; will reduce fire danger; and will protect the great blue heron rookery. This MSA was chosen for this activity because it is located outside the spotted owl home range radius and BEMA.

☐Inside the BECA reduce fuel hazard resulting from beetle kill along Road 4660 and other appropriate roads. (Short-term)

Opportunity -- Collect firewood within 150 feet of appropriate roads within the following parameters: collection areas should be open on some, but not all, roads in the MSA; should be located in areas that biologists determine will not result in detrimental impact to LOS emphasis species; and should be designated and monitored to ensure that adequate snag and down wood is retained in these areas throughout time.

Opportunity -- Redistribute "jackpot" coarse woody debris into adjacent regenerated stands.

Rationale: The BECA borders Road 4660 which is an important travelway, and therefore, has a higher risk of human-caused ignitions.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of bald eagle activity. Monitor presence and reproductive success.

■Conduct surveys to confirm presence and/or habitat utilization by great blue herons.

■Conduct surveys to confirm presence or absence of Preble's shrews.

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1660 RD.
MSA E

MANAGEMENT STRATEGY AREA - E

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

Portions of the MSA fall within the home range radius of two known spotted owl pairs. Within the MSA 65 acres or 3% is currently NRF habitat. The mixed conifer dry and wet PAGs comprise 1,911 acres or 76% of the MSA and are considered to be potential NRF habitat. The MSA provides a dispersal corridor linking owl activity centers and LOS mixed conifer habitat within the MSA. Restoration of dispersal and NRF habitat in the MSA is also important to the species to reestablish a functional north-south habitat link with the Cultus LSR located approximately 10 miles north of this LSR.

Selected Other Species

- Northern goshawk and marten
- Fisher - No documented sightings have been recorded in this MSA, but there is high potential for this MSA to serve as a travelway and/or home range territory with habitat restoration and limited disturbance.
- Bald eagle - The eastern 25% of the MSA is in BECA.
- Habitat for the black-backed woodpecker and other woodpeckers exists in the lodgepole high elevation PAG.

Fragmentation

Although fragmentation due to past harvest occurs on only 20% of the MSA, the juxtaposition of the harvest units greatly limits habitat effectiveness for many wildlife species. Dispersing owls are vulnerable to predation by great horned owls in the fragmented areas. High road density and past harvest activities in the MSA have limited the usefulness of this potential habitat to fisher.

Late and Old Structured Stands

Currently within the MSA 408 acres or 16% exists as LOS. The lack of LOS identifies this area as a priority for enhancement activities.

ACRES OF LOS BY PAG

PAG	Acres
LD LPH MCW	44 353 11
TOTAL	408

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- MSA - E has potential habitat for listed fungi species in the following PAGs: Lodgepole High Elevation, Lodgepole Dry, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- There is low potential for habitat for listed bryophyte species in MSA - E.

Lichens -- This MSA has low potential for habitat for listed lichen species.

Vascular Plants -- MSA - E has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - E. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed mollusks in MSA - E.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	23%
Mixed Conifer Dry	59%
Lodepole Pine High Elevation	16%
Lodgepole Pine Dry	2%

Summary of Trends

- The lodgepole pine areas have had very little extensive management activity and, because of beetle activity, could be in need of management activity in the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed

conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point that much of the overstory is at risk of being lost to insects or stress.
•Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the areas which have not had regeneration harvests.
•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.
•In the short term, past management activities have removed the majority of the overstory and left pole and small understories which have a high component of true firs. These stands are also susceptible to change events.

Harvest Areas

•At present, 20% of this MSA has been entered with regeneration harvest activities.
•The 80% of the area not shown as having been harvested has been entered sometime in the past with at least some harvest activities. It appears that the older harvest activities selected the high risk overstory trees for removal, which may be the reason why these stands do not contain LOS at present.

Seral/Structural Stages

•Regeneration harvested stands are in the early seral/structural stages.
•The other harvested stands are in the mid/late seral/structural stages.
•Approximately 3% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* – Canopy is clumpy in stocking level and structure, with areas of seedlings interspersed with areas of saplings and poles. The canopy is frequently open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* – Regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in all lodgepole and mixed conifer PAGs.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area. A total of five fires have occurred in this MSA between 1940 and 1994, all five were lightning-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - E functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - E in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - E is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - E there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles and bikes or other mechanized wheel vehicles are also allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - E, EXISTING CONDITION

MSA - E

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, and Lodgepole Dry

Total Acres -- 2,501

Elevation Range -- 4,600 - 4,800

Land Allocation -- BECA, Dispersed Recreation, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Northern Spotted Owl, northern goshawk, fisher, marten, bald eagle, black-backed woodpecker and other woodpeckers

Botanical -- Potential ALVI and CYMO habitat.

Fragmentation (%) -- Regenerated Areas - 20%, Road Density - high

LOS (%) -- 16%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 3 (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- High (2)

Activities -- Snowmobile trail traverses area, matsutake mushroom known picking area, hunting

Commodities -- Commercial mushroom harvesting, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

•Provide a contiguous block of LOS in mixed conifer dry and wet PAGs to restore and maintain NRF habitat connectivity for owls, goshawks, fisher, and other associated species. (short and long-term)

•Obtain a balance of sustainable and suitable habitat across the LSR as described in the desired condition chart in Chapter 3. The focus for this MSA is to provide sustainable habitat in the short-term.

•Maintain a minimum of 40% of the MSA in suitable LOS climatic-climax habitat for emphasis and selected species. (long-term)

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

•Reduce fragmentation of habitat and potential disturbance to wildlife through travel and access management. (short and long-term)

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐In lodgepole pine stands consider uneven-aged management techniques to help ensure structural diversity suitable for dispersal of old-growth related species such as the northern spotted owl. Treatment of the lodgepole stands should occur only after some fragmentation reduction takes place in the mixed conifer stands. (Short and Long-term)

☐Utilize silvicultural treatments to reduce fire risk and enhance development of LOS using the guidelines listed in Chapter 3 for the multi-story treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short-term)

Monitor -- Determine which species are using the stands where the majority of the overstory was removed by logging activities.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

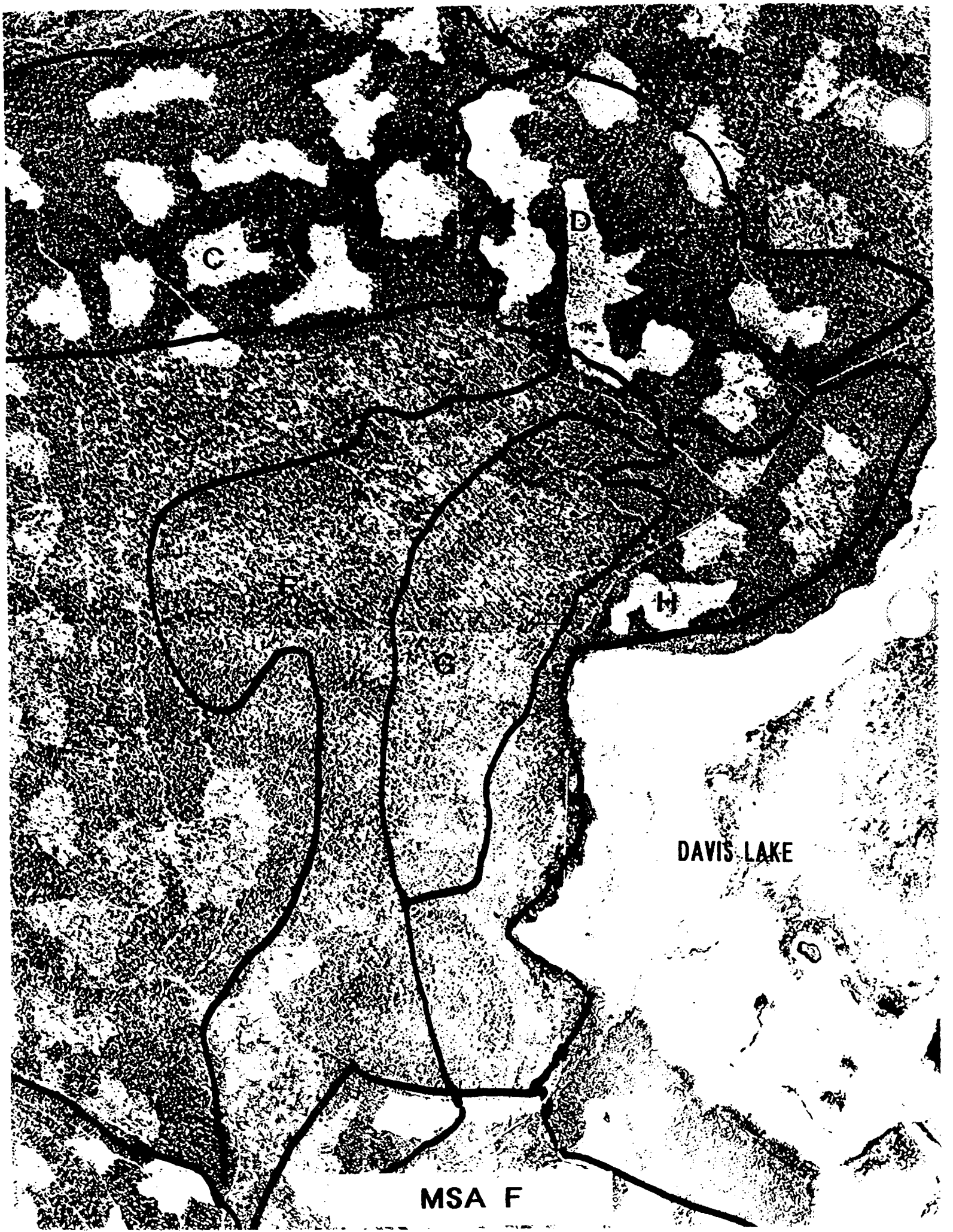
☐Identify roads for closure to reduce fragmentation and provide contiguous dispersal habitat for smaller plant and animal species that have low or limited mobility.

☐Seek opportunities to minimize the impacts of winter recreational use on fisher and other forest carnivores.

Monitor -- Use of the MSA by fisher and other forest carnivores.
Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat uilization of black-backed woodpeckers and northern goshawks.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MSA F

MANAGEMENT STRATEGY AREA - F

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

The majority of this MSA falls within the BECA. The MSA contains existing and potential eagle nest, forage, and perch sites. Eagle use of the area has been documented from 1973-1995.

Selected Other Species

•Northern spotted owl - This MSA does not contain NRF habitat for the owl, but the northwest lobe in the mixed conifer dry PAG may currently function as dispersal habitat for this species.
•Flammulated owl responses were documented in this MSA in 1995. This MSA also contains potential habitat for the white-headed woodpecker. Since 41% of this MSA is comprised of the ponderosa PAG, it is an appropriate area to provide fire-climax ponderosa pine stand conditions to support species associated with this type of LOS habitat.

Fragmentation

Within the MSA 38% is fragmented due to past harvest activities. Much of the past treatment, however, was uneven-aged management which resulted in very open stands with some large overstory trees remaining. While the existing condition of the MSA is not optimal habitat for the emphasis and selected species, some of the preferred structural components are present. The road density in the area is moderate to high.

Late and Old Structured Stands

Currently within the MSA none of the stands meet LOS criteria, which identifies the MSA as a "red-flag" area for habitat restoration.

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are below the levels identified as providing suitable habitat (Chapter 3).

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species exists in the following PAGs: Mixed Conifer Wet, Mixed Conifer Dry, and Ponderosa Pine.

Bryophytes -- There is low potential for habitat for listed bryophyte species in MSA-F.

Lichens -- MSA - F has low potential for habitat for listed lichen species in MSA-F.

Vascular Plants -- MSA-F has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA-F. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed mollusks in MSA-F.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	3%
Mixed Conifer Dry	56%
Ponderosa Pine Dry/Wet	41%

Summary of Trends

- Production, maintenance, or enhancement of large ponderosa pine and Douglas-fir nest and perch trees for the bald eagle is needed in this MSA, especially within the BECA.
- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the ponderosa stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine to the point where much of the overstory is at risk of being lost to insects or stress.
- Stand structures are becoming more complex as forested stands move towards later seral stages.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 38% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.

Canopy Cover

- *Regenerated Areas* -- Canopy is clumpy in stocking level and structure and is frequently open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- Regeneration harvested areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer PAGs and low severity in the ponderosa pine PAG.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area since 1940. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - F functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - F in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - F is included as part of the "LaPine Basin" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - F there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles and bikes or other mechanized wheel vehicles are also allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - F, EXISTING CONDITION

MSA - F

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, and Ponderosa

Total Acres -- 841

Elevation Range -- 4,600 - 4,800

Land Allocation -- BECA, General Forest, Scenic Views - R/MG, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Bald Eagle, flammulated owl, white-headed woodpecker, deer, elk, northern spotted owl

Botanical -- Known MIJE site, potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 38%, Road Density - moderate to high fragmentation

LOS (%) -- 0%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 3 on Ranger Butte (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- High (2)

Activities -- Snowmobile trail crosses the southern tip, hunting

Commodities -- Wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain an overstory of ponderosa pine and Douglas-fir which contains dominant or codominant trees >35 inches in dbh which could be used as nest or perch trees.

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

•Provide a large block of suitable fire-climax mixed conifer dry and ponderosa pine to support associated LOS species interspersed with patches of denser forest conditions in a mosaic pattern throughout the MSA.

•Obtain a balance of sustainable and suitable habitat across this MSA and the LSR as described in the desired condition chart in Chapter 3. (short and long-term)

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐Retain the structural complexity of the northwest lobe of the MSA to provide habitat connectivity until the regenerated areas in MSA - E mature into dispersal habitat for the spotted owl. (Short-term)

☐Manage forested stands within BECA for maintenance of fire-climax conditions. Utilize silvicultural treatments, e.g. the single-story treatment scenarios described in Chapter 3, and prescribed burning to promote and maintain open park-like fire-climax conditions with an abundant large tree component using the following criteria:

-- Thin the understory shrub and small tree component prior to reintroduction of fire where appropriate.
-- Manage to provide 35+ inch dbh ponderosa pine and Douglas-fir for nest trees.
-- No more than 50% of the BECA should be burned in the next decade. The initial burning entry would occur in early spring.

-- "Units" should vary in size; be interspersed with patches of unthinned, unburned areas; and be located strategically to reduce risk of human-caused fire. Within the burned area retain 20-40% of the shrub component for neotropical migratory birds.
-- Unburned areas, portions where the shrub component will be retained, and snags and down logs may need to be lined to prevent them from being consumed during the prescribed burn.
-- Maintain the unburned, unthinned patches in a mosaic pattern throughout the MSA.
(Short and Long-term)

Rationale: These options were based on a synthesis of the team's professional judgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.
Monitor -- Set up a station to monitor air quality.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Do not increase access and seek opportunties to reduce roads and fragmentation in appropriate areas.

Monitoring, Evaluation, and Research

■Research the potential for tree culturing/pruning to enhance nest tree suitability.

■Conduct neotropical migratory bird surveys before and after vegetative treatments. Monitor changes in species richness and abundance.

■Conduct surveys to confirm the presence and/or habitat utilization of white-headed woodpeckers and flammulated owls.

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MANAGEMENT STRATEGY AREA - G

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

This MSA falls entirely within the Davis Lake West BEMA and contains potential nest, forage, and perch sites. Eagle use of the area has been documented from 1973-1995.

Selected Other Species

- Flammulated owl responses were documented in this MSA in 1995. The MSA contains potential habitat for the white-headed woodpecker. The ponderosa pine PAG comprises 62% or 288 acres of the MSA. The MSA contains the largest block of ponderosa pine in the LSR, identifying it as one of the most appropriate areas to provide fire-climax ponderosa pine stand conditions to support these species.
- Deer and elk habitat needs should be considered due to the proximity to the key elk area.

Fragmentation

Within the MSA 51% is fragmented due to past harvest activities. The majority of the past treatment, however, was uneven-aged management which resulted in very open stands with some large overstory trees remaining. While the existing condition of the MSA is not optimal habitat for the emphasis and selected species, some of the preferred structural components are present. The road density in the area is high.

Late and Old Structured Stands

Currently within the MSA none of the stands meet LOS criteria, which identifies the MSA as a "red-flag" area for habitat restoration.

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are below the levels identified as providing suitable habitat (Chapter 3).

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species are found in the Mixed Conifer Dry and Ponderosa Pine PAGs.

Bryophytes -- This MSA has low potential for habitat for listed bryophytes in MSA - G.

Lichens -- Low potential for habitat for listed lichen species exists in MSA - G.

Vascular Plants -- MSA - G has potential habitat for Candy Stick (*Allotropa virgata*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - G. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed mollusks in MSA - G.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	33%
Ponderosa Pine Dry/Wet	67%

Summary of Trends

- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the ponderosa stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine to the point where much of the overstory is at risk of being lost to insects or stress.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as mixed conifer stands develop multiple layers resulting from ingrowth of true firs.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 51% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.
- This MSA does not contain any suitable NRF habitat for the spotted owl.

Canopy Cover

- *Regenerated Areas* - Canopy is clumpy in stocking level and structure and is open in places allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Harvested areas are mostly clumpy canopies with a variety of density and structure in an uneven-aged management regime.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer PAGs and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area since 1940. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - G functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - G in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR and MSA - G is included as part of the "LaPine Basin" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - G motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - G, EXISTING CONDITION

MSA - G

PAG(s) -- Mixed Conifer Dry and Ponderosa

Total Acres -- 466

Elevation Range -- 4,400 - 4,600

Land Allocation -- BEMA, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Bald Eagle, flammulated owl, white-headed woodpecker, deer, elk

Botanical -- Known MIJE location, potential ALVI habitat

Fragmentation (%) -- Regenerated Areas - 51%, Road Density - high fragmentation

LOS (%) -- 0%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- Low

Fire Hazard -- High

Access -- High (7)

Activities -- Snowmobile trail along eastern boundary, hunting

Commodities -- Wood products

Criteria for Developing Appropriate Treatments

Desired Condition

In stands that have the site potential, manage to obtain or move towards the conditions for suitable ponderosa pine fire-climax and the description below. Maintain an overstory of ponderosa pine and Douglas-fir which meets the following characteristics: 1) Dominant or codominant trees are >35 inches in dbh, have a limb structure that will support a nest, and provide a view of the primary foraging area; and 2) Stand size, density, and canopy closure are sufficient to provide a visual buffer from human disturbance and protection from nest and nest tree blowdown (Anthony and Isaacs 1989). In addition, suitable replacement trees are developing in the stand.

Intermixed with the above habitat maintain areas having a contiguous, multi-storied, forested condition. Stands should be managed to obtain or move towards the conditions identified in the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Provide a large block of optimal fire-climax open ponderosa to support associated LOS species interspersed with patches of denser forest conditions in a mosaic pattern throughout the MSA.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐Manage forested stands within BEMA for maintenance of fire-climax conditions. Utilize silvicultural treatments, e.g. the single-story treatment scenarios described in Chapter 3, and prescribed burning to promote and maintain open park-like fire-climax conditions with an abundant large tree component using the following criteria:

-- Thin the understory shrub and small tree component prior to reintroduction of fire where appropriate.
-- Manage to provide 35+ inch dbh ponderosa pine and Douglas-fir for nest trees.
-- No more than 50% should be burned in the next decade. The initial burning entry would occur in early spring.
-- "Units" should vary in size; be interspersed with patches of unthinned, unburned areas; and be located strategically to reduce risk of human-caused fire. Within the burned area retain 20-40% of the shrub component for neotropical migratory birds.

-- Unburned areas, portions where the shrub component will be retained, and snags and down logs may need to be lined to prevent them from being consumed during the prescribed burn.
-- Maintain the unburned, unthinned patches in a mosaic pattern throughout the MSA.
(Short and Long-term)

Rationale: These options were based on a synthesis of the team's professional jusgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐A Bald Eagle Management Plan needs to be prepared prior to the occurrence of any vegetative management within the BEMA.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Do not increase access and seek opportunities to reduce roads and fragmentation in appropriate areas.

☐Continue blocking user-defined roads to Davis Lake using rocks, posts, logs, and/or vegetation.

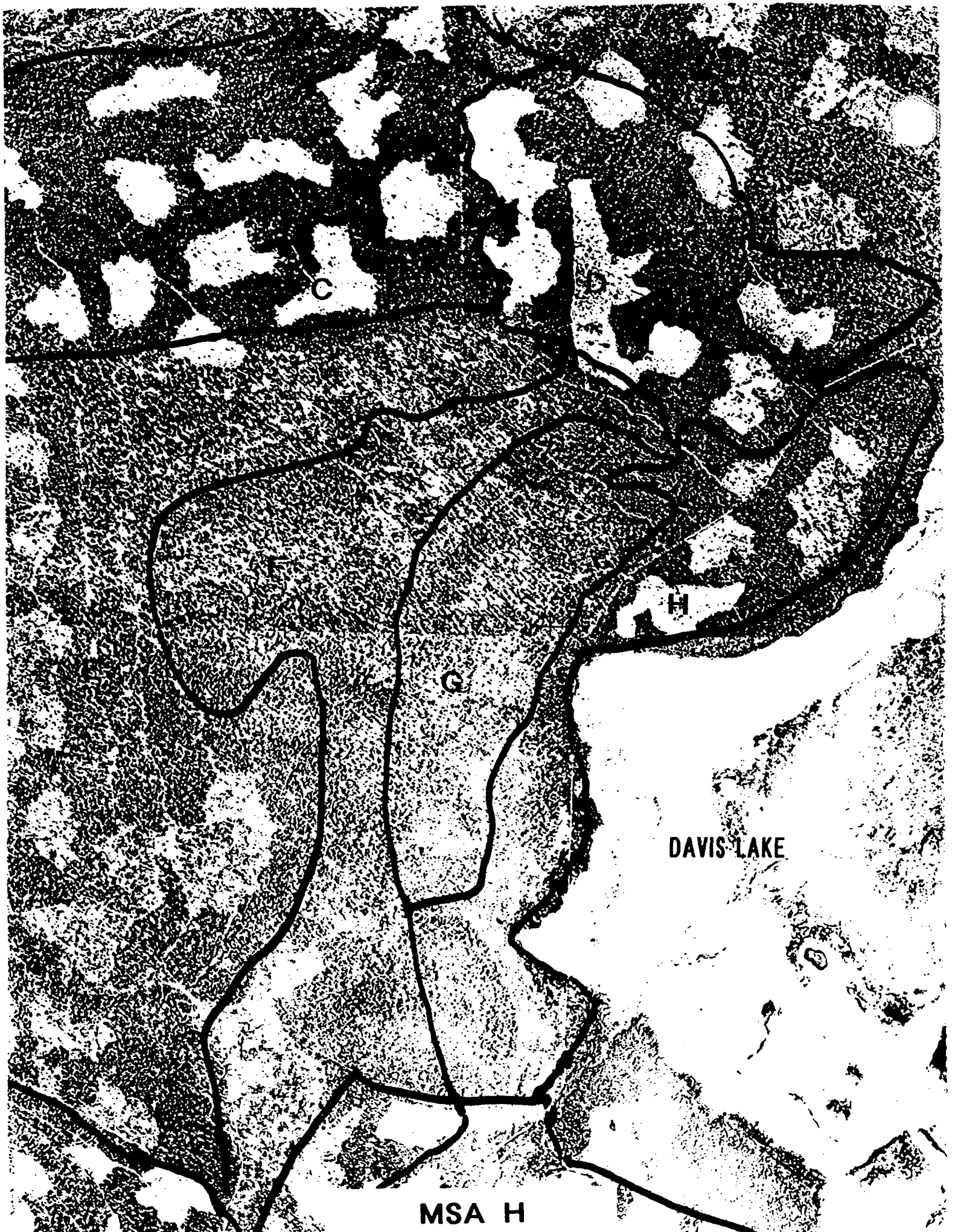
Monitoring, Evaluation, and Research

■Research the potential for tree culturing/pruning to enhance nest tree suitability.

■Conduct annual monitoring of bald eagle activity. Monitor presence and reproductive success.

■Conduct surveys to confirm presence and/or habitat utilizaiton by flammulated owls and white-headed woodpeckers.

■Conduct neotropical migratory bird surveys before and after treatment within the BEMA. Monitor changes in species richness and abundance.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MANAGEMENT STRATEGY AREA - H

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle and Great Gray Owl

This MSA falls entirely within the Davis Lake West BEMA and contains potential eagle nest, forage, and perch sites. Eagle use of the area has been documented from 1973-1995. A comprehensive Bald Eagle Management Plan must be completed for this area prior to the occurrence of any management activities. The MSA also contains potential great gray owl habitat. Great gray owl use was not detected during preliminary surveys conducted in 1995, however, the potential for great gray owl use of the MSA is high.

Selected Other Species

•The MSA is known or suspected to support osprey, marten, black-backed woodpeckers, flammulated owls, deer, elk, neotropical migratory birds, and other songbirds.

Fragmentation

Within the MSA 51% is fragmented due to past harvest activities. This fragmentation is concentrated in the northern half of the MSA in the lodgepole dry PAG. Existing fragmentation reduces habitat effectiveness for the majority of the species listed above and is of particular concern for the great gray owl.

Late and Old Structured Stands

Currently within the MSA 354 acres or 56% exists as LOS and is primarily located in the lodgepole dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
LD LMW	338 16
TOTAL	354

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species exists in the Lodgepole Dry and Mixed Conifer Dry PAGs.

Bryophytes -- There is low potential for habitat for listed bryophytes in MSA - H.

Lichens -- This MSA has low potential for habitat for listed lichen species.

Vascular Plants -- MSA - H has potential habitat for Candy Stick (*Allotropa virgata*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - H. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed mollusks in MSA - H.

Arthropods -- Survey strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	28%
Lodgepole Pine Dry	69%
Lodgepole Pine Moist/Wet	3%

Summary of Trends

- The lodgepole pine areas have had extensive management activity and evidence of that activity is expected to remain into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer dry stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These

ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 51% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.
- This MSA does not contain any suitable NRF habitat for the spotted owl.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- Salvaged areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Moderate

No significant lightning or human-caused ignitions have occurred within this area. A total of eight fires have occurred in this MSA between 1940 and 1994, of these five were lightning-caused, and three were human-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - H functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - H in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six

areas also apply to the Davis LSR, and MSA - H is included as part of the "Davis Lake" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - H motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed, while bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - H, EXISTING CONDITION

MSA - H

PAG(s) -- Mixed Conifer Dry, Lodgepole Dry, and Lodgepole Wet

Total Acres -- 626

Elevation Range -- 4,400 - 4,500

Land Allocation -- BEMA, General Forest, Special Interest Area - Davis Lake, Scenic Views - R/MG, Scenic Views - PR/MG

Landscape Area(s) -- Davis Lake (Odell WA)

Wildlife -- Bald Eagle, Great Gray Owl, osprey, marten, black-backed woodpecker, flammulated owl, deer, elk, NTMB's, other songbirds

Botanical -- Known MIJE site, potential ALVI habitat

Fragmentation (%) -- Regenerated Areas - 51%, Road Density - Moderate fragmentation

LOS (%) -- 56%, primarily in the lodgepole dry PAG

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 3 Ranger Butte (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- Low (7)

Activities -- Snowmobile trail traverses area, hunting

Commodities -- Wood products

Criteria for Developing Appropriate Treatments

Desired Condition

In stands that have the site potential, manage to obtain or move towards the conditions for suitable ponderosa pine fire-climax and the description below. Maintain an overstory of ponderosa pine and Douglas-fir which meets the following characteristics: 1) Dominant or codominant trees are >35 inches in dbh, have a limb structure that will support a nest, and provide a view of the primary foraging area; and 2) Stand size, density, and canopy closure are sufficient to provide a visual buffer from human disturbance and protection from nest and nest tree blowdown (Anthony and Isaacs 1989). In addition, suitable replacement trees are developing in the stand.

Maintain lodgepole pine or mixed lodgepole/ponderosa pine stands of mid to late structural stages (lodgepole over 70 years of age, ponderosa over 200 years of age) in the vicinity of meadows.

Objective

Short-term (0-30 years)

- Maintain and enhance eagle habitat in the northern portion of the MSA (north of the 4660-350 road). In the southern portion of the MSA maintain eagle habitat in addition to maintaining and enhancing habitat for the great gray owl .

  Rationale: Potential habitat for both species is limited in the LSR. Many management activities that enhance development of suitable eagle habitat reduce habitat effectiveness for great gray owls. This division of the habitat in the MSA into the northern and southern portions for management is based on current use of the northern area by bald eagles and the location of the best potential habitat for both species. Ultimately, the intent is to preserve habitat potential for both species until additional information is obtained.

Long-term (30+ years)

- Based on knowledge of the species utilization of the MSA, manage to provide habitat for both great gray owls and bald eagles.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐No salvage, firewood collection, or vegetative management is appropriate until a Bald Eagle Management Plan is completed for this MSA. (Short-term)

☐Prior to any salvage, firewood collection, or vegetative management, assuming these activities are consistent with the Management Plan, great gray owl surveys should be completed to ensure that proposed activities will not detrimentally impact the species. (Short-term)

Monitor -- Determine the presence or absence of great gray owls via surveys that at a minimum meet USFS protocol.

☐Upon completion of the two previous management criteria, vegetative management in the northern portion should place emphasis on providing 35+ inch dbh ponderosa pine and Douglas-fir for nest trees. Treat according to the guidelines listed in Chapter 3 for the single-story treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐Emphasize management to retain large overstory ponderosa pine on areas within the lodgepole pine PAGs that have the site potential for ponderosa pine, while maintaining a relatively dense lodgepole understory. (Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Vegetative Management

☐Maintain meadow habitat.

Monitor -- Evaluate encroachment into meadows to determine if vegetative manipulation is necessary.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

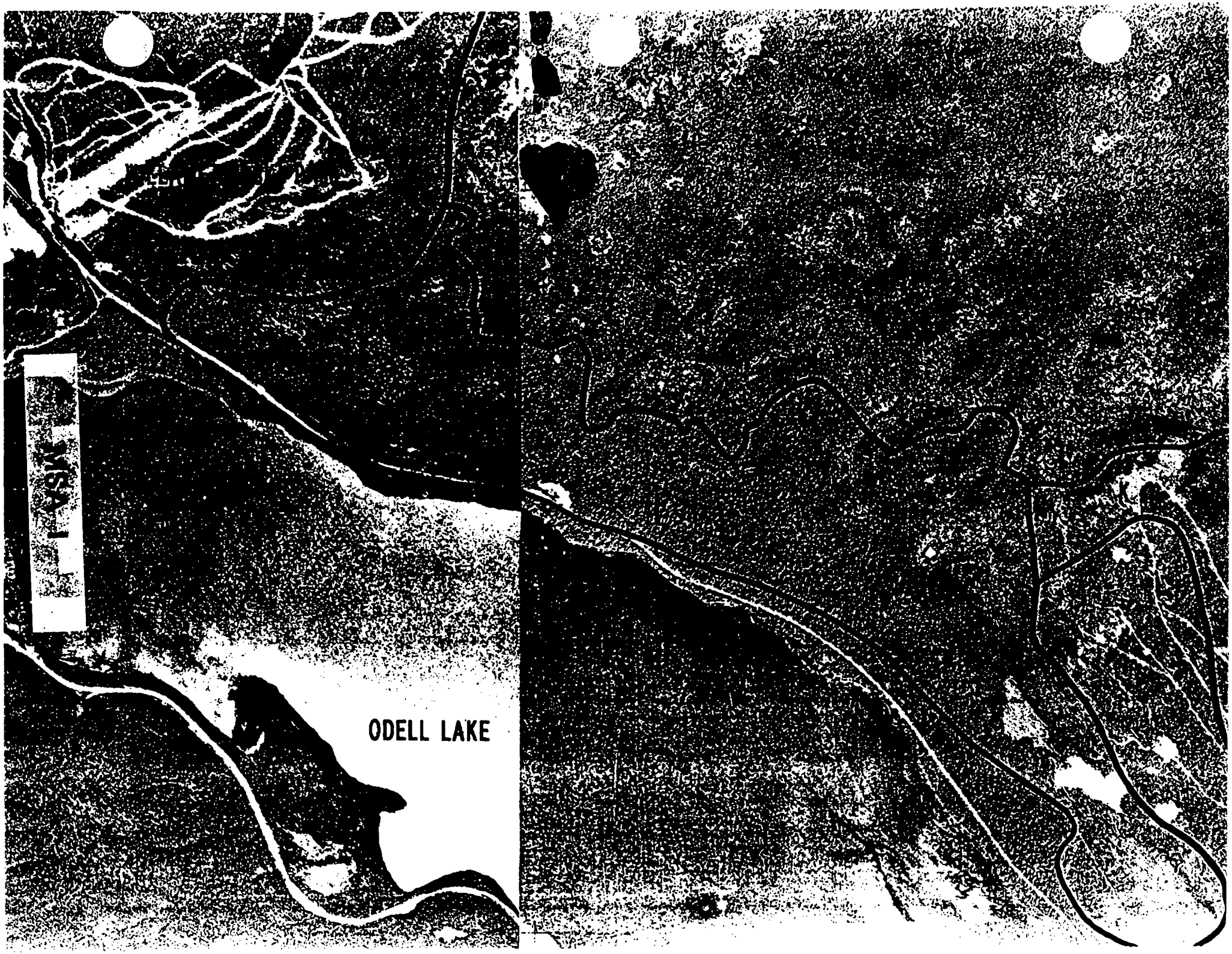
Access

☐Do not increase access and seek opportunities to reduce roads and fragmentation in appropriate areas.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm presence and/or habitat utilization by great gray owls and flammulated owls.

■Conduct annual monitoring of bald eagle activity. Monitor bald eagle presence and reproductive success.


ODELL LAKE

MANAGEMENT STRATEGY AREA - I

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

This MSA encompasses most of the Odell Lake East BEMA and portions of the associated BECA. Within the MSA 1,113 acres or 71% is in BEMA and as such requires a completed Bald Eagle Management Plan prior to vegetation management. The MSA contains existing and potential nesting, roosting, and foraging sites. Documentation of eagle use is recorded from 1975-1995.

Selected Other Species

- Northern Spotted Owl - This MSA provides a critical habitat link for dispersal and genetic exchange between "eastside and westside" owls. Suitable NRF habitat currently exists on 979 acres or 63% of the MSA. The mixed conifer habitat link between areas east and west of the Cascade Mountains is also very important for a multitude of other LOS associated species including low mobility plant and animal species.
- Creeks and associated riparian areas provide breeding and dispersal habitat for amphibians.
- The MSA is important osprey habitat and has the potential to function as a travelway for fisher.
- Goshawks and other forest Accipiters, pileated woodpeckers, and marten are also species that utilize habitat contained in this MSA.

Fragmentation

Fragmentation due to past harvest activities and/or roads is very low in the MSA. The MSA represents one of the most intact areas of mixed conifer in the LSR.

Late and Old Structured Stands

Within the MSA 1,211 acres or 78% exists as LOS. LOS stands in the MSA are believed to function as a key dispersal flow area over the Cascades. The majority of the LOS is located in the mixed conifer PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	9
LDMH	9
LPH	255
LMW	7
MCD Mid	55
MCW Mid	368
MCW Late	506
MH	2
TOTAL	1,211

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat exists for listed fungi species in the following PAGs: Mountain Hemlock, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- This MSA contains potential habitat for listed bryophyte species in riparian areas.

Lichens -- Potential habitat for listed lichen species is found in riparian areas in MSA - I.

Vascular Plants -- MSA - I has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- Known sites for noxious weeds in MSA - I occur along Highway 58 adjacent to Odell Lake.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Potential habitat for listed mollusks in MSA - I.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	63%
Mixed Conifer Dry	17%
Lodgepole Pine High Elevation	17%
Lodgepole Dry/Mountain Hemlock	1%
Lodgepole Pine Dry	1%
Other Incidental PAGs	1%

Summary of Trends

•This MSA provides an east/west link of mixed conifer between eastside and westside forests. This is the only such link for many miles to the north and south, so should be protected and enhanced to the greatest extent possible.

- Besides MSA - B, this MSA has the least amount of area impacted by management activities. This area seems to be relatively consistent with historic fire cycles and there is little notable influence from fire suppression activities.
- The lodgepole pine areas have had very little extensive management activity, and this trend is expected to continue into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles are moving lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands are somewhat intact, especially in the mixed conifer stands where understory trees are becoming established and only beginning to compete with the overstory seral species to the point where there is the risk of loss to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas, but is considerably lower than virtually all other MSAs.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 2% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.
- Approximately 63% of the area has suitable NRF habitat for spotted owls. This implies that these stands are becoming quite complex in structure, and will probably be increasingly at risk for catastrophic stand replacement events over time.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- A portion of the area was harvested several decades ago, apparently to remove the high risk trees that were susceptible to bark beetles. There is little evidence in the stands of the harvest activities, indicating the ecosystem in this MSA is fairly resilient.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Moderate

Some significant lightning or human-caused ignitions have occurred within this area. This is mostly due to the amount of human influence resulting from recreation and the major transportation route that passes through the MSA. A total of seventeen fires have occurred in this MSA between 1940 and 1994, three were lightning-caused, and fourteen were human-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - I functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - I in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR and MSA - I is included as part of the "Willamette Pass-Odell Lake Area." Refer to pp. 2-18 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - I motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

State Highway 58 parallels MSA - I, and the Midstate Electric utility corridor traverses the area, however, the majority of the area is roadless.

Summary Table

MANAGEMENT STRATEGY AREA - I, EXISTING CONDITION

MSA - I

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Lodgepole Wet, and Mountain Hemlock

Total Acres -- 1,561

Elevation Range -- 4,800 - 5,600

Land Allocation -- Dispersed Recreation, BEMA, BECA, Intensive Recreation, Scenic Views - PR/MG

Landscape Area(s) -- Odell Lake and Central Conifer Association (Odell WA)

Wildlife -- **Bald Eagle,** northern spotted owl, amphibians, osprey, fisher, northern goshawk, Accipters, pileated woodpecker, marten

Botanical -- St. John's wort occurs on Highway 58, potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - minimal, Road Density - low fragmentation

LOS (%) -- 78%

Insect and Disease Risk -- Moderate

Forest Density -- High

Soil Restoration Priority -- Priority 3 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- Low (7)

Activities -- Cross-country ski trails, Rosary Lake Trail, hunting

Commodities -- Wood products

Additional Information -- Houses are located along the periphery of the MSA to the north of Odell Lake.

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain areas in a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

In stands that have the site potential (particularly south of Highway 58), manage to obtain or move towards the conditions described below. Maintain an overstory of ponderosa pine and Douglas-fir which meets the following characteristics: 1) Dominant or codominant trees are >35 inches in dbh, have a limb structure that will support a nest, and provide a view of the primary foraging area; and 2) Stand size, density, and canopy closure are sufficient to provide a visual buffer from human disturbance and protection from nest and nest tree blowdown (Anthony and Isaacs 1989). In addition, suitable replacement trees are developing in the stand.

Maintain a highly functional habitat link between owls east and west of the Cascade Mountains.

Objective

Short-term (0-50 years) --

- Allow this MSA to function as a natural, relatively unmanaged, mixed conifer old growth ecosystem to provide contiguous habitat for bald eagles and a diversity of other species. This MSA will also provide an area where information can be obtained on a "natural" ecosystem.

Long-term (50+ years) --

- Maintain a minimum of 80% of the MSA in suitable climatic-climax LOS habitat for emphasis and selected species.

  Rationale: It is believed that this MSA can sustain a minimum of 80% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of this MSA is in the mixed conifer wet PAG which can sustain a higher percentage of LOS. Maintaining a minimum of 80% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management in LOS is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: This MSA currently serves a key habitat connectivity function for spotted owls and is demonstrating few signs of declining stand health. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, i.e. ≥ 30% of the MSA, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐A Bald Eagle Management Plan needs to be prepared prior to the occurrence of any vegetative management within BEMA.

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum per occurrence using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of existing sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Opportunity -- Treat HYPE populations along Highway 58.

Access

☐Maintain current levels of access including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.

Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Education

☐Utilize interpretation and signing to inform and educate people about natural resources and ecosystem function.

Opportunity -- Place signs and prepare an informative brochure on fire prevention and the role of fire in the ecosystem.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization of the following species: amphibians, fisher, and other forest carnivores.

■Conduct annual monitoring of bald eagle activity. Monitor presence and reproductive success.

MSA J

MANAGEMENT STRATEGY AREA - J

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

This MSA is located almost entirely within the Odell Lake East BECA.

Selected Other Species

•Northern Spotted Owl - This MSA contributes to a critical dispersal corridor that connects "eastside and westside" owls. NRF habitat currently exists on 190 acres or 36% of the MSA. The mixed conifer habitat link between areas east and west of the Cascade Mountains is also important for a multitude of other LOS associated species including low mobility plant and animal species.
•Habitat that is suitable for the spotted owl also provides appropriate areas for the goshawk and travelways for fisher and other forest carnivores.

Fragmentation

Fragmentation due to past harvest activities and/or roads is minimal (8%) within the MSA.

Late and Old Structured Stands

Within the MSA 453 acres or 85% exists as LOS. A portion of the MSA (140 acres) is designated as part of an Old Growth Management Area. This MSA is adjacent to MSA - I, and together they represent one of the most intact mixed conifer wet habitats in the LSR.

ACRES OF LOS BY PAG

PAG	Acres
LD	32
LDMH	18
LPH	255
LMW	24
MCD Mid	2
MCW Mid	15
MCW Late	51
MH	14
PD	42
TOTAL	453

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at

least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species is located in the following PAGs: Mountain Hemlock, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Mixed Conifer Wet, Mixed Conifer Dry, and Ponderosa Pine.

Bryophytes -- This MSA contains potential habitat for listed bryophytes along the Odell Creek riparian zone.

Lichens -- Potential habitat for listed lichens exists along the Odell Creek riparian zone.

Vascular Plants -- MSA - J has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- St. John's wort is present along Highway 58. There is potential for other noxious weeds along roads and in harvest units.

Invertebrates -- See Botanical section for additional information.

Mollusks -- Potential habitat for listed mollusks exists in MSA - J.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	27%
Mixed Conifer Dry	11%
Lodgepole Pine High Elevation	34%
Lodgepole Dry/Mountain Hemlock	4%
Lodgepole Pine Dry	7%
Lodgepole Pine Moist/Wet	5%
Ponderosa Pine	9%
Mountain Hemlock	3%

Summary of Trends

- This MSA provides a continuation of the east/west link of mixed conifer between eastside and westside forests that was also discussed with MSA - I. This is the only such link for many miles to the north and south, so should be protected and enhanced to the greatest extent possible.

- This MSA has a considerable amount of area that is unaffected by management activities. This area seems to be relatively consistent with historic fire cycles and there is little notable influence from fire suppression activities.
- The lodgepole pine areas have had little extensive management activity, and this trend is expected to continue into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles are moving or have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands are somewhat intact, especially in the mixed conifer stands where understory trees are becoming established and only beginning to compete with the overstory seral species to the point where there is the risk of loss to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas, but is considerably lower than virtually all other MSAs.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 8% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.
- Approximately 36% of the area has suitable NRF habitat for spotted owls. This implies that these stands are becoming quite complex in structure, and will probably be increasingly at risk for catastrophic stand replacement events over time.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- A portion of this area was harvested several decades ago, apparently to remove the high risk trees that were susceptible to bark beetles. There is little evidence in the stands of the harvest activities, indicating the ecosystem in this MSA is fairly resilient.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs and high severity in the mountain hemlock PAG.

Hazard Analysis -- Moderate

Dense understories and a relatively small amount of ground fuels exist within the area. This area has been relatively unaffected by fire suppression activities, however, it would be susceptible to a high severity stand replacement event in the right conditions.

Risk Analysis -- Low

No significant lightning or human-caused ignitions have occurred within this area. A total of two fires have occurred in this MSA between 1940 and 1994, both were human-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - J functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - J in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR and MSA - J is included as part of the "Willamette Pass-Odell Lake Area." Refer to pp. 2-18 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - J motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - J, EXISTING CONDITION

MSA - J

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Lodgepole Wet, Ponderosa and Mountain Hemlock

Total Acres -- 531

Elevation Range -- 5,400 - 6,000

Land Allocation -- Dispersed Recreation, BECA, General Forest, Intensive Recreation, Old Growth, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association and West Odell Creek (Odell WA)

Wildlife -- **Bald Eagle,** northern spotted owl, goshawk, fisher and other forest carnivores

Botanical -- Potantial ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 8%, Road Density - moderate fragmentation

LOS (%) -- 85%, OGMA

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- High

Fire Hazard -- Moderate

Access -- High (7)

Activities -- Cross-country ski trails are located throughout area, hunting

Commodities -- Wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain areas in a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Manage to maintain an overstory of ponderosa pine and Douglas-fir which contains dominant or codominant trees >35 inches in dbh which could be used as nest or perch trees for eagles.

Objective

Short-term (0-50 years) --

- Allow this MSA to function as a natural, relatively unmanaged, mixed conifer old growth ecosystem to provide contiguous habitat for bald eagles and a diversity of other species. This MSA will also provide an area where information can be obtained on a "natural" ecosystem.

Long-term (50+ years) --

- Maintain a minimum of 80% of the MSA in suitable LOS climatic-climax habitat for emphasis and selected species.

  Rationale: It is believed that this MSA can sustain a minimum of 80% in suitable LOS climatic-climax condition. This determination was based on the site potential and existing and desired condition for the PAGs within the MSA. Maintaining a minimum of 80% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: This MSA currently serves a key habitat connectivity function for spotted owls and is demonstrating few signs of declining stand health. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, i.e ≥ 30% of the MSA, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum per occurrence using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Opportunity -- Treat HYPE populations along Highway 58.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.
Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Education

☐Utilize interpretation and signing to inform and educate people about natural resources and ecosystem function.

Opportunity -- Place signs and prepare an informative brochure on fire prevention and the role of fire in the ecosystem.

Monitoring, Evaluation, and Research

- Conduct surveys to confirm the presence and/or habitat utilization of fisher and other forest carnivores.
- Conduct annual monitoring of bald eagle activity. Determine presence and reproductive success.

MSA K

MANAGEMENT STRATEGY AREA - K

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Documentation of owl use in the area exists from 1989-1995. Within the MSA 868 acres or 27% is currently NRF habitat. Most of the remaining area within the MSA is potential NRF. The lack of suitable habitat within the home range radius of the known owl pair in this MSA identifies it as a "red-flag" area within the LSR. Of the owls within the LSR this pair has the least amount of acreage of NRF habitat around the activity center. The MSA provides an important link for dispersal and genetic exchange between eastside and westside owls. The owls are in the "take" category at both the 0.7 and 1.2 mile radii from the owl center, with 25% NRF within 0.7 miles and 13% within 1.2 miles.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Marten, fisher, and wolverine
- Flammulated owl, white-headed woodpecker, and neotropical migratory birds
- Tailed frog -- Maklaks Creek provides existing habitat and confirmed observations of this species.

Fragmentation

Within the MSA 21% currently exists as regenerated areas. Heavy fragmentation of the habitat in the northeastern portion of the MSA has resulted from past harvest activities and high road density. This fragmentation greatly reduces the habitat effectiveness for owls, goshawks, pileated woodpeckers, fisher and other interior species.

Late and Old Structured Stands

Within the MSA 446 acres or 14% exists as LOS. The lack of LOS identifies this areas as a "red-flag" area for enhancement activities. The western portion of the MSA contains an Old Growth Management Area comprising 114 acres.

ACRES OF LOS BY PAG

PAG	Acres
LD	7
LDMH	32
LDH	38
LW	4
MCD Early	50
MCD Mid	54
MCD Late	66
MCW Mid	10
MCW Late	173
PD	12
TOTAL	446

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species occurs in the following PAGs: Lodgepole Dry/Mountain Hemlock, Lodgepole High Elevation, Lodgepole Dry, Mixed Conifer Wet, Mixed Conifer Dry, and Ponderosa Pine.

Bryophytes -- Potential habitat for listed bryophytes exists in MSA - K.

Lichens -- This MSA contains potential habitat for listed lichens.

Vascular Plants -- MSA - K has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - K. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Potential habitat for mollusks exists in MSA - K.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	47%
Mixed Conifer Dry	48%
Lodgepole Pine High Elevation	2%
Lodgepole Dry/Mountain Hemlock	1%
Ponderosa Pine Dry/Wet	1%
Other Incidental PAGs	1%

Summary of Trends

- The lodgepole pine areas have had little extensive management activity.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

- At present, 21% of this MSA has been entered with regeneration harvest activities.
- The 79% of the area which was not regeneration harvested has been entered in isolated instances with some harvest activities.

Seral/Structural Stages

- Regeneration harvested stands are in the early seral/structural stages.
- The other harvested stands are in the late/old seral/structural stages.
- Approximately 27 of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- Regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs, high severity in the mountain hemlock PAG, and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Moderate

Some significant lightning and human-caused ignitions have occurred within this area. A total of seventeen fires have occurred in this MSA between 1940 and 1994, thirteen were lightning-caused, and four were human-caused. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - K functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - K in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR and MSA - K is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - K there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails in the majority of the MSA, however, a portion of the MSA is located in the roadless area and motorized vehicles are prohibited on roads and trails there. Over snow vehicles, bikes or other mechanized wheel vehicles, cross-country skiing, and horses are also allowed throughout the MSA. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - K, EXISTING CONDITION

MSA - K

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Lodgepole Wet, Ponderosa, and Mountain Hemlock

Total Acres -- 3,210

Elevation Range -- 4,800 - 6,800

Land Allocation -- Dispersed Recreation, General Forest, Old Growth, Scenic Views - PR/MG, Scenic Views - FG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Northern Spotted Owl**, tailed frogs, northern goshawk, pileated woodpecker, marten, fisher, wolverine, flammulated owl, white-headed woodpecker, NTMB's

Botanical -- Known MIJE site, potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 21%, Road Density - high fragmentation

LOS (%) -- 14%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 and 3 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- High; (2) and some (7)

Activities -- Borders winter recreation trails - snowmobiling and cross country skiing could occur within MSA, hunting

Commodities -- Wood products

Additional Information -- Existing seeps and springs; habitat for J2 species, Maklaks Creek

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas. (throughout entire MSA)
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy. (within owl home range radius and Old Growth Management Area)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

- Reduce fragmentation of habitat and potential disturbanee to wildlife through travel and access management. (short and long-term)

- Reduce risk of owl habitat loss and enhance habitat for flammulated owls and white-headed woodpeckers in the area outside the home range radius of the spotted owl and Old Growth Management Area.

Rationale: Only 13% of this MSA currently exists as LOS, thus, the potential consequences of loss of this habitat are great. Although risk-reduction management within the home range radius and Old Growth Management Area did not seem justified, the team believed it would be prudent to manage some areas between the two for risk reduction. The objective in these areas is to maintain large overstory trees in a healthy condition to facilitate resistance to and resilience from damage agents and to provide habitat in the long-term for emphasis species.

Long-term (50+ years) --

- Maintain a minimum of 40% of the MSA in suitable LOS habitat for emphasis and selected species. (within the owl home range radius)

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

Overall Rationale: The LSR team believes that the objectives for emphasis and selected species are also appropriate for the Old Growth Management Area.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

☐Treat snowbrush (*Ceanothus*), manzanita, and chinkapin in regenerated areas to promote stand development if current knowledge indicates a feasible method.

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within the home range radius and Old Growth Management Area is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within this MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the multi-story treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐The majority of silvicultural treatments to reduce risk and promote development of large-tree structure should focus on the areas not currently in NRF during the next two decades. (Short-term - Outside Home Range and OGMA)

--Treated NRF stands must remain functional as foraging habitat for spotted owls following treatment. (Short and Long-term)
-- Treatment of fuel accumulations should not further deteriorate LOS habitat structure.
-- Utilize logging systems that minimize soil compaction and maximize snag retention. For example, it is preferable to use cable, aerial, and horse logging systems over ground-based systems.
-- Within the treatment area canopy closure ≥ 50% should remain following harvest.
Monitor Results -- Modify future treatments accordingly.

Rationale: These options were based on a synthesis of the team's professional judgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

Access

☐Do not increase access and actively seek opportunities to reduce roads and fragmentation in appropriate areas. Minimize the impacts from winter recreational use on fisher and other forest carnivores.

Monitor -- Use of the MSA by fisher and other forest carnivores. If the presence of fisher, lynx, or wolverine is confirmed, optimizing habitat for these species should be given priority over human recreational use. (The potential for conflict with human use exists primarily during winter).
Monitor -- Levels of motorized winter use, i.e. ATVs and snowmobiles.

☐Identify roads for closure to reduce fragmentation and provide contiguous dispersal habitat for smaller plant and animal species that have low or limited mobility.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of spotted owl activity. Monitor presence and reproductive success.

■Conduct a spatial and temporal owl prey base study. Monitor prey species diversity and density over time and among designated owl activity centers.

■Survey for presence of forest carnivores, especially fisher and wolverine. If presence is confirmed initiate a habitat utilization study and an evaluation of human use on this utilization.

■Conduct surveys to confirm the presence and/or habitat utilization of white-headed woodpeckers and flammulated owls.

MSA L

MANAGEMENT STRATEGY AREA - L

Existing Condition

Wildlife

Emphasis Species -- Species Associated with Riparian Habitat

Riparian vegetation along Odell Creek comprises a unique habitat type that is very limited and thus critical within the LSR. Species or species groups known or suspected to utilize the MSA include: elk, bats, great gray owls, Cascade frogs, tailed frogs (and other amphibians), Preble's shrew, neotropical migratory birds, bald eagles, osprey, black-backed woodpeckers, marten, and bull trout (historical use). Many of the species supported by this habitat are PETS species.

The gravel pit and the associated travel and noise impact big game calving in this MSA and spotted owls in adjacent MSAs.

This MSA and adjoining MSAs in the lodgepole pine PAG provide the best existing and potential habitat for black-backed woodpeckers and species with similar habitat needs.

Selected Other Species

•Northern spotted owl - The southern boot of the MSA is designated as NRF habitat and comprises approximately 128 acres located primarily in the lodgepole wet PAG. This habitat does not function as nesting habitat but most likely serves as foraging and/or dispersal habitat.

Fragmentation

Heavy fragmentation (approximately 39%) occurs outside the riparian habitat. Moderate to low road densities occur within the MSA, but the roads are frequently traveled and have the potential to negatively impact big game calving.

Late and Old Structured Stands

Within the MSA 1,345 acres or 61% exist as LOS lodgepole. The most contiguous habitat spans the eastern edge of the MSA. The eastern edge is a designated Old Growth Management Area.

ACRES OF LOS BY PAG

PAG	Acres
LD LW MCD Late	1,055 288 2
TOTAL	1,345

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- Potential habitat for listed fungi species is listed according to the following PAGs: Lodgepole Dry, Mixed Conifer Dry, and Ponderosa Pine.

Bryophytes -- Potential habitat for listed bryophyte species exists along Odell Creek in MSA - L.

Lichens -- This MSA has potential for listed lichen species in riparian habitat along Odell Creek.

Vascular Plants -- MSA - L has potential habitat for Candy Stick (*Allotropa virgata*). Several sites for the sensitive plant Jepson's Monkeyflower (*Mimulus jepsonii*) are in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - L. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Potential habitat for listed mollusk species exists along Odell Creek.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	1%
Lodgepole Pine Dry	81%
Lodgepole Pine Moist/Wet	15%
Ponderosa Pine Dry/Wet	3%

Summary of Trends

- The lodgepole pine areas have had extensive management activity and, because of beetle activity are expected to remain in need of management activity into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the ponderosa

stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine to the point where much of the overstory is at risk of being lost to insects or competition.
•Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events resulting from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/ recovering from catastrophic events.

Harvest Areas

At present, 39% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.
•Approximately 6% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* – Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* – Salvaged areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Moderate

Some significant lightning or human-caused ignitions have occurred within this area. A total of fourteen fires have occurred in this MSA between 1940 and 1994, five were lightning-caused and nine were human-caused. The area has a number of roads, so access is moderate. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - L functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - L in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - L is included as part of the "Odell Creek" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - L there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes or other mechanized wheel vehicles, cross-country skiing, and horses are also allowed throughout the MSA. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - L, EXISTING CONDITION

MSA - L

PAG(s) -- Mixed Conifer Dry, Lodgepole Dry, Lodgepole Wet, and Ponderosa

Total Acres -- 2,146

Elevation Range -- 4,800 - 6,800

Land Allocation -- General Forest, Old Growth, Scenic Views - R/FG, Scenic Views - PR/MG, Scenic Views - FG

Landscape Area(s) -- East Odell Creek; within the Odell Creek Key Watershed (Odell WA)

Wildlife -- Species Associated with Riparian Habitat, elk, bats, great gray owl, Cascade frog, tailed frog (and other amphibians), Preble's shrew, NTMB's, bald eagles, osprey, black-backed woodpecker, marten, spotted owl, bull trout (historic)

Botanical -- Know MIJE site, potential ALVI habitat

Fragmentation (%) -- Regenerated Areas - 39%, Road Density - low to moderate, but roads receive substantial use

LOS (%) -- 61%

Insect and Disease Risk -- Low

Forest Density -- Moderate

Soil Restoration Priority -- Priority 4 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- Moderate (2)

Activities -- Snowmobile trails criss-cross the area, Metolius-Windigo Horse Trail, dispersed camping, hunting, fishing, Scenic Byway, big trees

Commodities -- Odell gravel pit, firewood, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a sustainable LOS forest ecosystem through time that supports the diverse species associated with this MSA. Manage to provide and maintain a healthy riparian system according to the Aquatic Conservation Strategy and a viable LOS lodgepole pine component through time. Provide large contiguous blocks (1000 acres) of mature and overmature lodgepole for the black-backed woodpecker and marten that obtain or move towards the suitable habitat conditions described in Chapter 3. Refer to the Goals and Objectives listed for the East Odell Creek Landscape Area in the Odell Pilot Watershed Analysis.

Objective

Short-term (0-30 years), within the area to the northwest of Odell Creek -- Provide adequate habitat to support emphasis and selected species and provide fire protection for the adjacent MSA - K and riparian habitat within this MSA and adjacent MSAs.

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Promote existing LOS habitat.

Short-term (0-30 years), within areas to the southeast of Odell Creek -- Provide optimal habitat, within limitations of the existing condition, for emphasis and selected species.

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow the natural development of LOS lodgepole pine to continue at a slower rate than that of the managed stands in the northwest portion discussed above.

Short-term (0-30 years), within NRF habitat in southeastern boot of the MSA (south of Road 4670) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.
- Reduce fragmentation of habitat and potential disturbance to wildlife through travel and access management. (short and long-term)
- Provide habitat connectivity between the eastern and western halves of the LSR. (S and L)

Long-term (30+ years), within areas southeast and northwest of Odell Creek -- Provide a large contiguous block of LOS lodgepole through time that alternates between the two halves of the MSA, i.e. while the southeast portion is in LOS, the northwest portion is in an earlier seral stage.

- Maintain the two different halves of the MSA on different cycles at least 3-5 decades apart.

  Rationale: The team felt that this strategy would be the most viable option to ensure maintenance of the lodgepole habitat across the landscape in the long-term.

Long-term (30+ years), within NRF habitat in southeastern portion of the MSA --

- Provide suitable LOS habitat in this MSA through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3. Manage stands in the mixed conifer PAGs to provide suitable NRF habitat conditions.

Management Options

Management of Regenerated Areas

☐Throughout the MSA emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within the home range radius of the spotted owl is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation make further degradation of the habitat undesirable in the short-term. Known preventive measures for stand replacement events, such as salvage and thinning, would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels within the owl home range radius, treat according to the guidelines listed in Chapter 3 for the multistory treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐In the area to the northwest of Odell Creek, use silvicultural techniques such as fuels reduction, to sustain existing LOS until regenerated stands catch up. (Short-term)

Opportunity – Utilize wood fiber.

☐In the area to the northwest of Odell Creek, reduce fuels hazard by removing down, dead lodgepole within the following parameters:

- Treat ≤ 30% of this portion of the MSA in the next 30 years.
- Treat areas that have the greatest potential to provide fire protection for MSA - K.
- Retain levels of down woody debris consistent with the tonnage indicated in the suitable habitat condition tables and recommendations for dead wood management section in Chapter 3.
- Retain slash and landing piles to optimize marten habitat.

Opportunity – Utilize natural fuels reduction money, salvage harvesting using minimum impact ground-disturbing equipment, and/or firewood collection.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Protect and enhance habitat for bull trout which is provided by the riparian areas and the forested stands surrounding them. Examples of activities that would be detrimental to bull trout habitat include: activities that result in stream sedimentation and/or bank erosion, and activities that modify the overstory such that stream shade is decreased and water temperature is increased.

☐In the long-term allow the two contiguous patches (one in the northwestern and one in the southeastern portions of the MSA) to go through normal lodgepole cycling to provide optimal habitat for emphasis and selected species. (Long-term -- throughout the MSA with the exception of the boot in the southeast portion)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

☐It is expected that when the long-term objectives for this MSA are met, natural processes will make snag and down woody debris management unnecessary. (Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum in the short-term using the least aggressive ground-disturbing tactics in the safest manner. In the long-term keep fires to a 300 acre maximum. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. Prevent losses to the adjacent MSAs from fire that starts in this MSA. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- Changes in fire occurrence.
Monitor -- Changing conditions and management direction over time.
Monitor -- Conduct black-backed woodpecker surveys.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

☐Minimize impacts to riparian habitat.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan. For those species protection of individual plants or animals takes precedence.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

☐Use weed-seed-free-feed to prevent the introduction and spread of noxious weeds on the Metolius-Windigo Horse Trail.

☐Utilize existing native surface open/closed roads within potential MIJE areas to sustain and perpetuate MIJE populations.

Access

☐Do not increase access and seek opportunities to reduce roads and access in appropriate areas.

☐Maintain, control, or eliminate encroaching lodgepole pine along the Scenic Byway (20 feet).

Rationale: Reduce the risk of fire and enhance the viewing of big trees. Provide MIJE habitat.

☐Maintain park-like stands near the Scenic Byway Viewpoint to allow travelers opportunities to view the LSR.

Opportunity – Utilize public education to explain the purpose of the LSR.

Commodities

☐The operation of the Odell Pit is not neutral, beneficial, or desirable for LOS associated species, however, it is not practical at this time to close or further restrict pit operations.

Rationale: Successful reproduction of spotted owls occurred in the vicinity of the pit while it was in full operation and the elk restriction was in place. The LSR team felt that the pit operation was not a significant impact to the function of the LSR for the spotted owl at this point.

Monitoring, Evaluation, and Research

■Conduct research to establish a range of appropriate levels of snags and down woody debris to be maintained in each PAG in the MSA and throughout the LSR. Some level of research should be completed prior to activities that remove these habitat components.

■Conduct surveys to confirm presence and/or habitat utilization of the black-backed woodpecker.

■Conduct surveys for bats. Monitor use of bat boxes installed under bridges and in other appropriate locations. Initiate a study to determine presence of maternity colonies, winter hibernacula, and roost-site characteristics.

■Conduct neotropical migratory bird surveys both before and after treatments. Monitor changes in species richness and abundance.

■Conduct winter track-surveys to monitor marten use of slash piles.

MSA M

MANAGEMENT STRATEGY AREA - M

Existing Condition

Wildlife

Emphasis Species -- Species Associated with Riparian Habitat

Riparian vegetation along Odell Creek comprises a unique habitat type that is very limited and thus critical within the LSR. Species or species groups known or suspected to utilize the MSA include: elk, bats, great gray owls, Cascade frogs (and other amphibians), beaver, Preble's shrew, neotropical migratory birds, bald eagles, osprey, black-backed woodpeckers, marten, and bull trout (historical use). Many of the species supported by this habitat are PETS species.

Ranger Creek also provides unique riparian habitat and contains a historical sighting of tailed frogs. This creek also has abundant beaver activity.

This MSA and adjoining MSAs in the lodgepole PAG provide the best existing and potential habitat for black-backed woodpeckers and species with similar habitat needs.

The MSA contains the following land allocations from the LRMP with specific standards and guidelines: Key Elk Area, Old Growth Management Area, and BECA. The MSA was distinguished from other MSAs containing riparian habitat in the same PAG because it is a key elk area and serves as an important fawning ground for deer and elk. Currently both summer and winter recreation use conflict with optimizing wildlife habitat in the MSA.

Fragmentation

Fragmentation of LOS habitat is moderate (29%) from past harvest activities. The riparian areas are largely intact. Road densities are low, but open roads are frequently traveled.

Late and Old Structured Stands

Within the MSA 878 acres or 64% exists as LOS lodgepole. A contiguous block of mature and overmature lodgepole borders Davis Lake. A portion of this MSA is classified as an Old Growth Management Area (44 acres).

ACRES OF LOS BY PAG

PAG	Acres
LD LPH LW	754 13 111
TOTAL	878

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: Lodgepole High Elevation, Lodgepole Dry, and Mixed Conifer Dry.

Bryophytes -- This MSA has potential habitat for listed bryophytes along Odell and Ranger Creeks.

Lichens -- Potential habitat for listed lichens exists along riparian zones of Odell and Ranger Creeks.

Vascular Plants -- MSA - M has potential habitat for Candy Stick (*Allotropa virgata*). There are documented occurrences of Jepson's monkeyflower (*Mimulus jepsonii*) in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - M. There is potential for noxious weeds along roads, in harvest units, and in recreation areas.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Potential habitat for listed mollusk species exists around springs and riparian areas associated with Odell and Ranger Creeks.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Lodgepole Pine High Elevation	1%
Lodgepole Pine Dry	88%
Lodgepole Pine Moist/Wet	11%
Other Incidental PAGs	<1%

Summary of Trends

- The lodgepole pine areas have had extensive management activity and, because of beetle activity are expected to remain in need of management activity into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.

•Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material.
•Stand structures are becoming more complex as lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.

Harvest Areas

At present, 29% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Salvaged areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the all of the lodgepole pine PAGs.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A moderate percentage of this MSA has had significant harvest activity.

Risk Analysis -- Moderate

Some significant lightning or human-caused ignitions have occurred within this area. A total of six fires have occurred in this MSA between 1940 and 1994, all six were human-caused. The potential for future ignitions may be magnified due to the amount of use along roads and the amount of recreation that occurs in the area.

Social Context

Reference to Odell WA

To understand how MSA - M functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - M in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - M is included as part of the "Odell Creek" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - M motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - M, EXISTING CONDITION

MSA - M

PAG(s) -- Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry, and Ponderosa

Elevation Range -- 4,400 - 4,500

Total Acres -- 1,364

Land Allocation -- BECA, General Forest, Intensive Recreation, Old Growth, Scenic Views - R/FG, Scenic Views - FG

Landscape Area(s) -- East Odell Creek and Davis Lake; within the Odell Creek Key Watershed (Odell WA)

Wildlife -- Species Associated with Riparian Habitat, elk, bats, great gray owl, Cascade frog, tailed frog (and other amphibians), beaver, Preble's shrew, NTMB's, bald eagle, osprey, black-backed woodpecker, marten, bull trout (historic)

Botanical -- Known MIJE location, potential ALVI site

Fragmentation (%) -- Regenerated Areas - 29%, Road Density - low, but roads receive substantial use

LOS (%) -- 64%

Insect and Disease Risk -- Low

Forest Density -- Moderate

Soil Restoration Priority -- Priority 4 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- Moderate

Access -- Moderate (7)

Activities -- Snowmobile trail crosses the northwest corner, Metolius-Windigo Horse Trail, developed East and West Davis Lake Campgrounds, Scenic Byway, big trees, dispersed camping, hunting, fishing

Commodities -- Fee campsites, firewood, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a sustainable LOS forest ecosystem throughout time that supports the diverse species associated with this MSA. Manage to provide and maintain a healthy riparian system according to the Aquatic Conservation Strategy and a viable LOS lodgepole pine component through time. The LOS habitat should obtain or move towards the suitable habitat conditions described in Chapter 3. (Short-term 0 - 30 years and Long-term 30+ years) Refer to the Goals and Objectives listed for the East Odell Creek Landscape Area in the Odell Pilot Watershed Analysis.

Objective

Obtain a balance of sustainable and suitable habitat in a mosaic across the MSA as described in the desired condition chart in Chapter 3.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Maintain balance between accelerating growth and providing hiding cover in regenerated areas. (Short and Long-term)

Opportunity -- Maintain hiding cover in 50% of the regenerated areas. (Short-term)
Opportunity -- Accelerate growth in 50% of the regenerated areas. (Short-term)

Rationale: Instead of precommercially thinning all of the regenerated areas to a wide spacing that optimizes tree growth, we recommend varied spacing in some regenerated areas which will accelerate but not maximize tree growth. The benefit of this strategy is the maintenance of deer and elk hiding cover through time.

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐In a mosaic across the MSA maintain the following:
-one-third of the MSA in LOS at a given time in the long-term;
-one-third in mid-seral condition; and
-one-third in early-seral. (Long-term)
Each of these three seral stages should be appropriately distributed across the MSA to attain the MSA objective.

Rationale: A wide array of species utilizes this MSA, including species needing early-seral, mid-seral, and late-seral habitat. This area is designated as a key elk area in the LRMP and also falls within the Late-Successional Reserve. These two management designations present a conflict. Although it is understood that the ROD for the Northwest Forest Plan amends the DNF LRMP, the team did not feel that it was prudent or desirable to ignore the MSAs present function or biological potential in providing

key elk habitat. The LSR team felt that it was best to balance the various seral conditions across the MSA in order to provide habitat for the widest variety of species that could potentially use it. The management option listed above does not optimize elk habitat, nor does it provide LOS across the landscape, since neither of those scenarios meets the long-term needs of the species or complies with the intent of management direction.

☐Outside the Old Growth Management Area (East Odell Creek) reduce fuel hazard in forested areas by removing down, dead lodgepole on up to 30% of the area in the next 30 years within the following parameters: (Short-term)

--Retain levels of down woody debris consistent with the tonnage indicated in the suitable habitat condition tables and recommendations for dead wood management section in Chapter 3.
--Retain slash and landing piles to optimize marten habitat.
--Focus fuel reduction activities on appropriate heavily traveled roads with elevated fire risks, i.e. Roads 4660, 4669, 855, and 600.
Opportunity -- Utilize natural fuels reduction money, salvage harvesting using minimum impact ground-disturbing equipment, and/or firewood collection.

☐Consider LRMP Standards and Guidelines WL 47-50 when implementing all management activities. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Protect and enhance habitat for bull trout which is provided by the riparian areas and the forested stands surrounding them. Examples of activities that would be detrimental to bull trout habitat include: activities that result in stream sedimentation and/or bank erosion, and activities that modify the overstory such that stream shade is decreased and water temperature is increased.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

☐It is expected that when the long-term objectives for this MSA are met, natural processes will make snag and down woody debris management unnecessary. (Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

☐Minimize impacts to riparian habitat.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

☐Use weed-seed-free-feed to prevent the introduction and spread of noxious weeds on the Metolius-Windigo Horse Trail.

☐Utilize existing native surface open/closed roads within potential MIJE areas to sustain and perpetuate MIJE populations.

Access

☐Do not increase access and seek opportunities to reduce roads and fragmentation in appropriate areas.

Opportunity -- Close the 600 Road.

☐Maintain park-like stands near the Scenic Byway Viewpoint to allow travelers opportunities to view the LSR.

Opportunity -- Utilize public education to explain the purpose of the LSR.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm presence and/or habitat utilization of the following species: black-backed woodpeckers, amphibians, bats, and neotropical migratory birds.

■Conduct surveys for bats. Monitor use of bat boxes installed under bridges and in other appropriate locations. Initiate a study to determine presence of maternity colonies, winter hibernacula, and roost-site characteristics.

■Conduct winter track-surveys to monitor marten use of slash piles.

DAVIS LAKE
MSA N

MANAGEMENT STRATEGY AREA - N

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

This MSA falls entirely within the Davis Lake East BEMA and contains numerous existing and/or potential eagle nest, forage, and perch sites. Documentation of eagle use is available from 1971 - 1995. Recreational use of the area presents a conflict with optimizing eagle habitat. Human-caused fire is also an issue in this MSA and potentially jeopardizes existing habitat.

Selected Other Species

- Osprey and neotropical migratory birds
- Northern Spotted Owl - 225 acres or 43% of the MSA is designated as NRF, however, because potential habitat for eagles is limited to forested areas adjacent to lakes, it is recommended by the LSR team that eagle habitat be emphasized in this MSA.

Fragmentation

ientation due to past harvest activities is very low. No harvest activities have been recorded for this Fragmentation from roads is moderate, as numerous user-defined roads have been created in this

and Old Structured Stands

i the MSA 135 acres or 26% exists as LOS and is located in the mixed conifer dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
MCD Early MCD Late	44 91
TOTAL	135

is and Down Woody Debris

ng levels of snags and down woody debris throughout the MSA are most likely below the levels fied as providing suitable habitat (See Chapter 3). However, these levels are believed to be at minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands rently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species in the Mixed Conifer Dry PAG.

Bryophytes -- There is low potential for habitat in MSA - N for listed bryophyte species.

Lichens -- There is low potential for habitat in MSA - N for listed lichen species.

Vascular Plants -- MSA - N has potential habitat for Candy Stick (*Allotropa virgata*).

Noxious Weeds -- MSA - N has known sites for knapweed and common toadflax along Highway 46. There is potential for other noxious weeds along the roads and in the campgrounds.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- There is low potential for habitat for listed mollusk species in this MSA.

Arthropods -- Survey strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	87%
Ponderosa Pine Dry/Wet	13%

Summary of Trends

- This MSA is in BEMA. It is characterized by a large, open-grown ponderosa pine overstory, with lodgepole pine, ponderosa pine, Douglas-fir, true firs, and an occasional isolated mountain hemlock in the understory.
- Understory stands are very dense, and initial stages of declining overstory as a result of this competition are evident across the MSA. Damage agents include bark beetles, root rot, and fir engraver beetles, and they are beginning to affect the overstory ponderosa pine and Douglas-fir.
- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or other stress-related problems.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as the lodgepole in the stands develop multiple layers and heavy fuel loadings as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.

•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

•At present, this MSA has not been entered with regeneration harvest activities.
•This MSA has been entered in isolated instances with some non-regeneration harvest activities.

Seral/Structural Stages

Approximately 43% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* -- Regeneration occurs in small patches where holes in the overstory canopy exist, therefore, most of the MSA has a relatively continuous canopy cover.

•*Harvested Areas* -- Harvest activities seem to have been limited to salvage of overstory trees in isolated areas, therefore, the canopy cover is virtually intact.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer dry PAG and low severity in the ponderosa pine PAG.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. The majority of this MSA has not had significant harvest activity.

Risk Analysis -- Moderate

Some significant lightning or human-caused ignitions have occurred within this area. A total of twenty-seven fires have occurred in this MSA between 1940 and 1994, three were lightning-caused and the other twenty-four were human-caused. Access is high in this MSA. The potential for future ignitions may be magnified due to the existing fuel conditions and the continual build-up of fuels over the area in the absence of treatment.

Social Context

Reference to Odell WA

To understand how MSA - N functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - N in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - N is included as part of the "Davis Lake" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - N motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

The 855 Road to the Davis Lake Campgrounds is included in MSA - N. This road parallels Davis Lake and users have created their own access routes to the lakeshore by finding gaps in the vegetation and driving the short distance to the lake. Removal of vegetation on the lakeside of the 855 Road will create additional opportunities for users to create more roads.

Summary Table

MANAGEMENT STRATEGY AREA - N, EXISTING CONDITION

MSA - N

PAG(s) -- Mixed Conifer Dry and Ponderosa

Total Acres -- 521

Elevation Range -- 4,400 - 4,600

Land Allocation -- BEMA, Intensive Recreation

Landscape Area(s) -- Davis Lake Area (Odell WA)

Wildlife -- **Bald Eagle,** osprey, NTMB's, northern spotted owl

Botanical -- Potential ALVI habitat, noxious weeds - known knapweed and common toadflax sites along Highway 46.

Fragmentation (%) -- No recorded harvest activities, Road Density - moderate

LOS (%) -- 26%, primarily in MCD

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- Moderate

Access -- Moderate (7) Road 855

Activities -- Borders Road 855 to East and West Davis Lake Campgrounds, Lava Flow Campground, hunting, Scenic Byway, big trees

Commodities -- N/A

Criteria for Developing Appropriate Treatments

Desired Condition

In stands that have the site potential, manage to obtain or move towards the conditions for suitable mixed conifer dry and ponderosa pine fire-climax and the description below. Maintain an overstory of ponderosa pine and Douglas-fir which meets the following characteristics: 1) Dominant or codominant trees are >35 inches in dbh, have a limb structure that will support a nest, and provide a view of the primary foraging area; and 2) Stand size, density, and canopy closure are sufficient to provide a visual buffer from human disturbance and protection from nest and nest tree blowdown (Anthony and Isaacs 1989). In addition, suitable replacement trees are developing in the stand.

Objective

•Maintain and enhance the MSA as optimal bald eagle habitat to the greatest extent possible while restricting, but not eliminating, recreational opportunities.

•Obtain a balance of sustainable and suitable habitat across the LSR as described in the desired condition chart in Chapter 3. The focus for this MSA is to provide sustainable fire-climax habitat in the short-term.

Management Options

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐Manage forested stands within BEMA for maintenance of suitable mixed conifer dry and ponderosa pine fire-climax habitat conditions. Utilize silvicultural treatments, e.g. the single-story treatment scenarios described in Chapter 3, and prescribed burning to promote and maintain open park-like, fire-climax conditions with an abundant large tree component using the following criteria:

-- Thin the understory shrub and small tree component prior to reintroduction of fire where appropriate.
-- Manage to provide 35+ inch dbh ponderosa pine and Douglas-fir for nest trees.
-- No more than 50% of the BEMA should be burned in the next decade to maintain future management options and provide diversity. The initial burning entry would occur in early spring.
-- "Units" should vary in size, be interspersed with patches of unthinned, unburned areas, and be located strategically to reduce risk of human-caused fire. Within the burned area retain 20-40% of the shrub component for neotropical migratory birds.
-- Unburned areas: portions of the units where the shrub component will be retained; and snags and down logs may need to be lined to prevent them from being consumed during the prescribed burn.
-- Maintain the unburned, unthinned patches in a mosaic pattern throughout the MSA.
(Short and Long-term)

Rationale: Mixed conifer dry and ponderosa pine stands in this MSA were historically fire-climax stands. Human fire suppression activities have resulted in a dense understory condition that leaves the large overstory trees vulnerable to insects, disease, and fire. Heavy utilization of the area by humans greatly

increases the probability of fire in the MSA. It is assumed that management activities such as those recommended will provide protection from these elements. Because this is a BEMA, and habitat for bald eagles is limited in the LSR, the team felt that management activities, e.g. thinning and burning, that maximize protection of bald eagle habitat was appropriate here. This MSA represents one area where maintenance of the fire-climax condition for LOS species associated with this habitat type justified lowering the quality of habitat for species associated with the climatic-climax habitats, e.g. spotted owl.

Rationale: These options were based on a synthesis of the team's professional judgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐A Bald Eagle Management Plan needs to be prepared prior to the occurrence of any vegetative management within the BEMA.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor – Overstory loss due to fire.
Monitor – For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan. For those species protection of individual plants or animals takes precedence.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Between Road 855 and Davis Lake utilize lodgepole screens to provide wildlife habitat and to limit off-road access to Davis Lake.

☐Continue access restrictions to Lava Flow Campground during the bald eagle seasonal restriction periods. In other words, continue gating the road between January 1 and August 31 each year. (Short-term)

Rationale: This recommendation ensures consistency with the Deschutes National Forest LRMP; eliminates potential harassment of emphasis species during nesting season; and reduces a recurring source of conflict with the public, by establishing a fixed time period for public access to the campground.

☐Continue blocking user-defined roads to Davis Lake using rocks, posts, logs, and/or vegetation.

Monitoring, Evaluation, and Research

■Research the potential for tree culturing/pruning to enhance nest tree suitability.

■Conduct before and after neotropical migratory and breeding bird surveys to determine the potential effects of treatment on species richness, diversity, and population densities.

■Monitor bald eagle use and nesting success.

MSA O

MANAGEMENT STRATEGY AREA - O

Existing Condition

Wildlife

Emphasis Species -- Bald Eagle

The majority (95%) of this MSA is located within the Davis Lake East BEMA and contains numerous eagle nest, forage, and perch sites. Documentation of eagle use is available from 1971 - 1995. Recreational use of the area presents a conflict with optimizing eagle habitat. Human-caused fire is also an issue.

Selected Other Species

- Osprey, white-headed woodpecker, flammulated owl - The MSA contains osprey nests and has potential habitat for white-headed woodpeckers and flammulated owls.
- Northern Spotted Owl - 1,008 acres or 66% of the MSA is designated as NRF habitat, however, because potential habitat for eagles is limited to forested habitat adjacent to lakes, it has been recommended by the LSR team that eagle habitat be emphasized in this MSA.

Fragmentation

In the past 33% or 502 acres of the MSA has been harvested and no longer meets LOS condition. Many of the treated units, however, were shelterwood harvested and still retain the large tree component, therefore continue to function as habitat for a variety of species. Road density is high and impacts to emphasis and selected species are moderate.

Late and Old Structured Stands

Within the MSA 699 acres or 46% exists as LOS and is primarily in the mixed conifer dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
MCD Early	135
MCD Late	338
MCW Late	219
PP	7
TOTAL	699

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: Mixed Conifer Wet, Mixed Conifer Dry, and Ponderosa Pine.

Bryophytes -- There is low potential for habitat for listed bryophyte species in MSA - O.

Lichens -- This MSA has low potential for habitat for listed lichen species.

Vascular Plants -- MSA - O has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- MSA - O has known sites for bull thistle in harvest units. There is potential for other noxious weeds along roads.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- This MSA has low potential habitat for listed mollusks.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	18%
Mixed Conifer Dry	76%
Ponderosa Pine Dry/Wet	6%

Summary of Trends

- This MSA is part of the BEMA. It is characterized by a large, open-grown ponderosa pine overstory, with lodgepole pine, ponderosa pine, Douglas-fir, true firs, and an occasional isolated mountain hemlock in the understory.
- Understory stands are very dense and initial stages of declining overstory as a result of this competition are evident across the MSA. Damage agents include bark beetles, root rot, and fir engraver beetles, and they are beginning to affect the overstory ponderosa pine and Douglas-fir.
- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole in the stands develop multiple layers and heavy fuel loadings as a result of beetle activity.

•Susceptibility to stand replacement events from insects, disease, and fire is increasing on most of the unharvested areas. Helen Maffei, Area IV Forest Pathologist, commented that at the rate things are happening now, there is probably 20-30 years before catastrophic losses from diseases are likely. This could change given continuing drought conditions or some other factors which might enhance disease epidemic conditions.
•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

•At present, 29% of this MSA has been entered with regeneration harvest activities.
•The 71% of the area that has not been regenerated harvested has been entered in isolated instances with some harvest activities.

Seral/Structural Stages

•Regeneration harvested stands are in the early seral/structural stages.
•The other harvested stands are in the late/old seral/structural stages.
•Approximately 66% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* – Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* – Regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer dry PAG and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A moderate percentage of this area has had significant harvest activity.

Risk Analysis -- Moderate

Some significant lightning or human-caused ignitions have occurred within this area. A total of two fires have occurred in this MSA between 1940 and 1994, one was lightning-caused and one was human-caused. Access within this MSA is high. The potential exists for an ignition start to occur as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - O functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - O in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - O is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - O motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - O, EXISTING CONDITION

MSA - O

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry and Ponderosa

Total Acres -- 1,526

Elevation Range -- 4,600 - 5,000

Land Allocation -- BEMA, Intensive Recreation, Scenic Views - R/FG, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Bald Eagle, osprey, white-headed woodpecker, flammulated owl, northern spotted owl

Botanical -- Potential ALVI and CYMO habitat. Noxious weeds - known bull thistle sites in regenerated areas.

Fragmentation (%) -- 33%, Road Density - high

LOS (%) -- 46%, primarily in MCD

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- High (7)

Activities -- Matsutake mushroom known picking area, hunting, Scenic Byway, big trees

Commodities -- Commercial mushroom harvesting, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

In stands that have the site potential, manage to obtain or move towards the conditions for suitable mixed conifer dry and ponderosa pine fire-climax as described in Chapter 3 and the description below. Maintain an overstory of ponderosa pine and Douglas-fir which meets the following characteristics: 1) Dominant or codominant trees are >35 inches in dbh, have a limb structure that will support a nest, and provide a view of the primary foraging area; and 2) Stand size, density, and canopy closure are sufficient to provide a visual buffer from human disturbance and protection from nest and nest tree blowdown (Anthony and Isaacs 1989). In addition, suitable replacement trees are developing in the stand.

Objective

•Maintain and enhance the MSA as optimal bald eagle habitat to the greatest extent possible.

•Obtain a balance of sustainable and suitable habitat across the LSR as described in the desired condition chart in Chapter 3. The focus for this MSA is to provide sustainable fire-climax habitat in the short-term.

Management Options

Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐Manage forested stands within BEMA for maintenance of suitable mixed conifer dry and ponderosa pine fire-climax conditions. Utilize silvicultural treatments, e.g. the single-story treatment scenarios described in Chapter 3, and prescribed burning to promote and maintain open park-like, fire-climax conditions with an abundant large tree component using the following criteria:

-- Thin the understory shrub and small tree component prior to reintroduction of fire where appropriate.
-- Manage to provide 35+ inch dbh ponderosa pine and Douglas-fir for nest trees.
-- No more than 50% of the BEMA should be burned in the next decade. The initial burning entry would occur in early spring.
-- "Units" should vary in size, be interspersed with patches of unthinned, unburned areas, and be located strategically to reduce risk of human-caused fire. Within the burned area retain 20-40% of the shrub component for neotropical migratory birds.

-- Unburned areas; portions of the units where the shrub component will be retained; and snags and down logs may need to be lined to prevent them from being consumed during the prescribed burn.
-- Maintain the unburned, unthinned patches in a mosaic pattern throughout the MSA.
(Short and Long-term)

Rationale: These options were based on a synthesis of the team's professional judgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐A Bald Eagle Management Plan needs to be prepared prior to the occurrence of any vegetative management within the BEMA.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)
Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Do not increase access and seek opportunities to reduce roads and fragmentation in appropriate areas.

Monitoring, Evaluation, and Research

- Research the potential for tree culturing/pruning to enhance nest tree suitability.

- Conduct before and after neotropical migratory and breeding bird surveys to determine the potential effects of treatment on species richness, diversity, and population densities.

- Monitor eagle use and nesting success.

Q
Q
MSA P

MANAGEMENT STRATEGY AREA - P

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl and Bald Eagle

Northern Spotted Owl - NRF habitat exists on 239 acres or 70% of the MSA. In addition to functioning as habitat for the spotted owl, NRF also provides for the bald eagle and the selected species named below.

Bald Eagle - This MSA falls within the Davis Lake East BECA. The MSA contains numerous eagle nest, forage, and perch sites. Documentation of eagle use is available from 1971 - 1995.

Selected Other Species

- Northern goshawk and other forest Accipiters, pileated woodpecker

Fragmentation

Fragmentation in the MSA is moderate (35%), however, the MSA borders a large (200 acre) regenerated area to the northwest in MSA - Q which limits habitat effectiveness.

Late and Old Structured Stands

Within the MSA 102 acres or 30% exists as LOS and is located within the mixed conifer dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
MCD Early MCD Mid MCD Late	3 29 70
TOTAL	102

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in the mixed conifer dry PAG.

Bryophytes -- This MSA has low potential for habitat for listed bryophyte species.

Lichens -- There is low potential for habitat for listed lichen species in MSA - P.

Vascular Plants -- MSA - P has potential habitat for Candy Stick (*Allotropa virgata*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - P. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- There is low potential for habitat for listed mollusk species in MSA - P.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	100%

Summary of Trends

- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where true fir and lodgepole pine are becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most or all of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

•At present, 35% of this MSA has been entered with regeneration harvest activities.

Seral/Structural Stages

•Regeneration harvested stands are in the early seral/structural stages.
•The other harvested stands are in the late/old seral/structural stages.
•Approximately 70% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Except for shelterwood harvest areas, regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration. In areas that were shelterwood harvested there is a component of overmature trees left on site over the regenerated areas.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer dry PAG and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A moderate amount of this MSA has had significant harvest.

Risk Analysis -- Moderate

Few significant lightning and human-caused ignitions have occurred within this area. One lightning-caused fire has occurred in this MSA between 1940 and 1994. Access to the area is very high. The potential exists for an ignition start to occur as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - P functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - P in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - P is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - P there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles and bikes or other mechanized wheel vehicles are also allowed everywhere. Cross-country skiing and horses are also allowed throughout the MSA. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - P, EXISTING CONDITION

MSA - P

PAG(s) -- Mixed Conifer Dry

Total Acres -- 339

Elevation Range -- 5,000 - 5,300

Land Allocation -- BECA, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Northern Spotted Owl, Bald Eagle, goshawk, other Accipiters, pileated woodpecker

Botanical -- Potential ALVI habitat

Fragmentation (%) -- Regenerated Area (35%) , Road Density - high

LOS (%) -- 30%, all within MCD

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- High (2)

Activities -- Matsutake mushroom known picking area, hunting

Commodities -- Commercial mushroom harvesting, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

In stands that have the site potential, manage to obtain or move towards the conditions for suitable mixed conifer dry fire-climax and maintain an overstory of ponderosa pine and Douglas-fir which contains dominant or codominant trees >35 inches in dbh which could be used as nest or perch trees.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.
- Provide a contiguous block of LOS climatic-climax condition to serve as habitat for spotted owls and bald eagles. (Short and Long-term)

Rationale: The LSR team recommended managing the BECA within this MSA as climatic-climax rather than fire-climax LOS, because approximately 2,047 acres adjacent to the MSA (in MSAs - N and O) will be managed as fire-climax; owl habitat fragmentation in adjacent MSA - Q is extensive, and thus makes retention of climatic-climax desirable in this MSA to provide NRF; and to provide habitat connectivity to the Brown's LSR to the north.

Long-term (50+ years) --

- Provide suitable LOS habitat in this MSA through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3. Manage stands in the mixed conifer dry PAG to provide suitable NRF habitat conditions.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management is as follows: No silvicultural treatments are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the LSR make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures may not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are in imminent risk of being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Soils

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.
Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Monitoring, Evaluation, and Research

■Conduct surveys for cavity nesters with particular emphasis on pileated and white-headed woodpeckers.

MSA Q

MANAGEMENT STRATEGY AREA - Q

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Documentation of owl use in the area exists from 1978-1995. Within the MSA 2,348 acres or 57% is currently NRF habitat. The entire MSA is within the mixed conifer dry PAG and thus is potential NRF. Existing suitable habitat in the northwest quarter of the MSA provides a link to the Brown's LSR 3 - 5 miles to the north. The owls are not in the "take" category at either the 0.7 and 1.2 mile radii, due to 70% NRF within 0.7 miles and 59% NRF within 1.2 miles.

Selected Other Species

- Northern goshawk and other Accipiters, pileated woodpecker
- Northwest corner of the MSA is classified as BECA.

Fragmentation

Within the MSA 33% currently exists as regenerated areas. Heavy fragmentation of the habitat has resulted from past harvest activities and high road density. A fairly contiguous block of NRF habitat remains around the owl activity center. Dispersing owls are vulnerable to predation due to the juxtaposition of habitat and regenerated areas.

Late and Old Structured Stands

Within the MSA 1,219 acres or 30% exists as LOS and is located in the mixed conifer dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
MCD Mid MCD Late	499 720
TOTAL	1,219

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in the mixed conifer dry PAG.

Bryophytes -- MSA - Q has low potential for habitat for listed bryophyte species.

Lichens -- There is low potential for habitat for listed lichen species in MSA - Q.

Vascular Plants -- MSA - Q has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are known sites for bull thistle in harvest units in MSA - Q. There is potential for noxious weeds along roads.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential exists for habitat for listed species in MSA - Q.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	100%

Summary of Trends

- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and through competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where true fir and lodgepole pine are becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

- At present, 33% of this MSA has been entered with regeneration harvest activities.
- The 67% of the area that has not been regeneration harvested has been entered in isolated instances with some harvest activities.

Seral/Structural Stages

- Regeneration harvested stands are in the early seral/structural stages.
- The other harvested stands are in the late/old seral/structural stages.
- Approximately 57% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

- ***Regenerated Areas*** -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- ***Harvested Areas*** -- Except for shelterwood harvest areas, regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration. In area that were shelterwood harvested there is a component of overmature trees left on site over the regenerated areas.

Fire

Historic Fire Regime -- Moderate to high severity

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. The majority of this area has had significant harvest activity.

Risk Analysis -- Moderate

Some lightning and human-caused ignitions have occurred within this area. A total of sixteen fires have occurred in this MSA between 1940 and 1994, fourteen were lightning-caused, and two were human-caused. Access to the area is high. The potential exists for an ignition start as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - Q functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - Q in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six

areas also apply to the Davis LSR, and MSA - Q is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - Q there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are also allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - Q, EXISTING CONDITION

MSA - Q

PAG(s) -- Mixed Conifer Dry

Total Acres -- 4,113

Elevation Range -- 4,600 - 5,200

Land Allocation -- BECA, General Forest, Scenic Views - R/FG, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Northern Spotted Owl**, bald eagle, northern goshawk, other Accipiters, pileated woodpecker

Botanical -- Potential ALVI and CYMO habitat. Noxious weeds -- bull thistle in regenerated units.

Fragmentation (%) -- Regenerated Areas - 33%, Road Density - high fragmentation

LOS (%) -- 30%, all within MCD

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 1 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- Moderate

Access -- High (2)

Activities -- Known matsutake mushroom picking area, hunting

Commodities -- Commercial mushroom harvesting

Additional Information -- Rhododendron site, porcupine problem

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas within the Home Range Radius and corridor at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.

- Reduce fragmentation of habitat and potential disturbance to wildlife through travel and access management. (short and long-term)

- Reduce risk of owl habitat loss and enhance habitat in the short-term for flammulated owls, white-headed woodpeckers, and bald eagles in the area outside the home range radius of the spotted owl and habitat connectivity corridor. (within both non-NRF and NRF)

Long-term (50+ years) --

- Maintain a minimum of 40% of the MSA in suitable LOS climatic-climax habitat for emphasis and selected species. (within the owl home range radius)

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry climatic-climax condition. This determination was based on the site potential and existing and desired condition for the mixed conifer dry PAG. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

- Provide a range of suitable and sustainable LOS habitat through time to contribute to the overall desired LSR habitat conditions defined in Table 3 - 1 of Chapter 3. The mixed conifer dry stands within this MSA will be managed to provide a combination of climatic-climax and fire-climax habitat conditions. (outside the owl home range radius)

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes

appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within the home range radius of the spotted owls is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the LSR make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the multistory treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Manage the forested stands within BECA for maintenance of mixed conifer dry fire-climax conditions while maintaining highly functional dispersal habitat for the spotted owl. Utilize silvicultural treatments, e.g. the single-story treatment scenarios described in Chapter 3, and prescribed burning to promote and maintain fire-climax conditions with an abundant large tree component using the following criteria:

- -- Maintain areas within the BECA as functional dispersal habitat for spotted owls. Use of 50-11-40 criteria would address this option.
- -- Thin the understory shrub and small tree component prior to reintroduction of fire where appropriate.
- -- No more than 50% of these stands within BECA should be burned in the next decade. The initial burning entry would occur in early spring.
- -- "Units" should vary in size, be interspersed with patches of unthinned, unburned areas and be located strategically to reduce the risk of human-caused fire.
- -- Maintain a large snag and down woody debris component throughout the lifetime of the LSR.
- -- Maintain the unburned, unthinned patches in a mosaic pattern within the portion of the MSA managed as BECA.

(Short and Long-term)

Rationale: The LSR team recommended managing the NRF habitat within the BECA for bald eagles, since eagles are limited to forested areas in the proximity of water. Since this is one of the few MSAs with suitable habitat for eagles, the recommendation is to manage it as such, while maintaining suitable dispersal habitat for owls in an important corridor. Treating NRF habitat for fire-climax within BECA should provide minimum functioning foraging habitat for spotted owls as long as 40% canopy cover and adequate down wood for prey base habitat is maintained.

☐Some of the treatments to create "fire-resistant" habitat should occur in 200-350 acre blocks. (outside home range radius)

Rationale: The LSR team believed that some large blocks were necessary to effectively halt/slow the progress of a wildfire and to provide habitat patch size sufficient to perform desired LOS function in the event that the surrounding habitat is lost.

☐The majority of silvicultural treatments to reduce risk and promote development of large tree structure should focus on the areas currently not in NRF. Where activities do occur in NRF habitat, the following criteria should be followed:

- Treated NRF stands must remain functional as foraging habitat for spotted owls following treatment.
- Treatment of fuel accumulations should not further deteriorate LOS habitat structure.
- Utilize logging systems that minimize soil compaction and maximize snag retention. For example, it is preferable to use cable, aerial, and horse logging systems over ground-based systems.
- Within the treatment area canopy cover ≥ 50% should remain following harvest.
- Treat no more than 50% of the area within the next 50 years.

(Short and Long-term within NRF outside of home range radius)

Monitor Results – Modify future treatments accordingly.

☐Utilize prescribed underburning within NRF habitat outside the home range radius where the following criteria can be met:

- Treat NRF habitat in small blocks.
- Burn in intervals of between 5-10 years.
- Within the first decade 5% will be treated.
- Treat no more than 50% in the next 50 years.
- Maintenance burns will occur every few years if previous management criteria are continually met.
- Maintain sustainable habitat.
- Use adaptive management to modify future treatment accordingly.

Monitor – Use radio telemetry to determine owl use of the habitat.

Rationale: Several conditions identify this MSA as an appropriate area to utilize vegetative manipulation to achieve protection and enhancement objectives in both NRF and non-NRF forested areas. They include:

1) The quality and quantity of owl habitat within the home range of the known owl pair is sufficient enough that lowering the quality of some NRF habitat outside home ranges and corridors is not expected to detrimentally impact owls.
2) The team believes that the potential benefits of risk reduction in the interest of long-term habitat protection and sustainability, justify lowering habitat quality short-term in limited areas outside the home range and corridors.
3) The team feels that it is beneficial to designate some areas that are currently LOS to be managed to maintain large overstory trees in a healthy condition to facilitate resistance to and resilience from damage agents. This MSA seems to be the most appropriate location for this management.
4) The suitable mixed conifer habitat condition that supports Eastside owls is very limited outside the LSR. Limited vegetative manipulation in this area will provide opportunities to learn which treatments are most effective at achieving the protect and enhance objectives.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (S and L)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan. For those species protection of individual plants or animals takes precedence.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Opportunity -- Treat bull thistle populations in regenerated areas.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.
Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Firewood

☐Seek opportunities to utilize personal use firewood collection within 150 feet of roads to reduce fire hazard within the following parameters:

-- Collection areas should be open on some, but not all, roads in the MSA; located in areas that biologists determine will not result in detrimental impact to LOS emphasis species; and designated and monitored to ensure that adequate snag and down wood is retained in these areas throughout time.

Monitoring, Evaluation, and Research

■Determine the effects of the vegetative treatments on the suitability and sustainability of habitat for the emphasis and selected species.

U
R
MSA R

MANAGEMENT STRATEGY AREA - R

Existing Condition

Wildlife

Emphasis Species -- Black-blacked Woodpecker

Optimal black-backed woodpecker habitat exists in LOS forested stands in the lodgepole dry PAG primarily in the southern half of the MSA. Potential habitat for the black-backed woodpecker exists throughout the MSA. Recurrent bark beetle outbreaks characteristic of the lodgepole dry PAG provide abundant foraging opportunities for black-backed woodpeckers and other insectivorous bird and mammal species.

Selected Other Species

- Northern spotted owl - The majority of the PAG lies within the home range of two owl pairs. About 20% of the MSA has potential to be NRF habitat. Opportunities exist to provide dispersal habitat connecting MSAs - T and S.
- Marten - Down woody debris that accumulates as beetle-killed overstory trees fall down will provide rest, den and forage sites for this species and support marten prey in the forested areas in the MSA.
- Three-toed woodpeckers, other woodpeckers, and cavity nesters

Fragmentation

Habitat fragmentation due to past harvest occurs on 44% of the MSA. Regenerated areas, not currently suitable black-backed woodpecker habitat, exist in a relatively continuous patch in the middle of the MSA. An expansive (1000 acre) regeneration harvest unit to the northeast of the MSA and a patchwork of other regeneration units limit available habitat adjacent to the LSR for several decades. Road density is low, but the roads receive high use.

Late and Old Structured Stands

Currently within the MSA 368 acres or 48% exists as LOS in the lodgepole dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
LD	368
TOTAL	368

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: lodgepole dry, mixed conifer wet, and mixed conifer dry.

Bryophytes -- There is low potential for habitat for listed bryophyte species in MSA - R.

Lichens -- This MSA has low potential for habitat for listed lichen species.

Vascular Plants -- MSA - R has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - R. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- There is low potential for habitat for listed species in MSA - R.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	6%
Mixed Conifer Dry	14%
Lodgepole Pine Dry	80%

Summary of Trends

Northern Portion of the MSA

- The lodgepole pine areas have had extensive management activity.
- Forested stands are moving towards later seral stages except where mountain pine beetles and harvest activities have moved lodgepole pine stands towards earlier seral stages.

Southern Portion of the MSA

- In the lodgeople pine areas considerable management activity has occurred.
- The majority of the unentered green lodgepole pine stands within this MSA are located in this area.
- Forested stands are moving towards later seral stages, with the exception of some of the lodgepole pine stands that have been moved back to middle or late stages as a result of beetle infestation.

Entire MSA

•In the mixed conifer, large tree-dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material.
•Stand structures are becoming more complex as lodgepole stands continue to develop multiple layers resulting from beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.

Harvest Areas

At present, 44% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Salvaged areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. The majority of this MSA has had significant harvest activity.

Risk Analysis -- Low

Few lightning and human-caused ignitions have occurred within this area. A total of three lightning fires have occurred in this MSA between 1940 and 1994. Access to the area is high. The potential exists for an ignition start as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - R functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - R in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - R is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - R there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - R, EXISTING CONDITION

MSA - R

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, and Lodgepole Dry

Total Acres -- 768

Elevation Range -- 5,000 - 5,200

Land Allocation -- General Forest

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Black-backed Woodpecker, northern spotted owl, marten, three-toed woodpecker, other woodpeckers and cavity nesters

Botanical -- Potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 44%, Road Density - low fragmentation, high use

LOS (%) -- 48%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- High (2)

Activities -- Hunting, 62 Road, scenic quality

Commodities -- Wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a viable LOS lodgepole pine component through time that obtains or is moving towards the suitable habitat condition described in Chapter 3.

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

•Provide a large patch of LOS lodgepole to serve as optimal habitat for black-backed woodpeckers and other species with similar habitat needs. (Short and Long-term)

•Obtain a balance of sustainable and suitable habitat across the LSR as described in the desired condition chart in Chapter 3. The focus for this MSA is to provide suitable habitat in the short-term.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management in the northern portion of the MSA is as follows: Allow natural processes to continue unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels with the exception of fuel hazard reduction along Highway 62. (Short-term)

Rationale: The existing condition of the forested areas in the MSA provides suitable habitat for emphasis and selected species.

☐If the desired structural components are in imminent risk of being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐Reduce fuel hazard by removing down, dead lodgepole pine along Highway 62. (Short-term)

Opportunity -- Collect firewood within the following parameters:

-- Collection areas should be open on some, but not all, roads in the MSA; located in areas that biologists determine will not result in detrimental impact to LOS emphasis species; and designated and monitored to ensure that adequate snag and down wood is retained in these areas throughout time.

Rationale: Highway 62 is a main travelway with high use, consequently, there is an elevated risk of habitat loss due to human-caused fire. Risk reduction in this area (at the base of Saddle Butte) provides protection of NRF habitat in adjacent MSA - S.

☐In the southern portion of the MSA utilize uneven-aged management techniques to provide dispersal habitat for spotted owls and habitat connectivity for a variety of species between Hamner and Ringo Buttes. Refer to the habitat connectivity guidelines in Chapter 3. Treatment should occur within the following parameters:

-- Defer treatment for 10 years allowing regenerated stands to develop.

-- Treat ≤ 50% of the forested area in this portion of the MSA.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization by black-backed woodpeckers.

MSA S

MANAGEMENT STRATEGY AREA - S

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Documentation of owl use in the area exists from 1979-1995. Within the MSA 627 acres or 29% is currently NRF habitat. Almost all of the MSA is in the mixed conifer wet and dry PAGs and thus is potential NRF. No NRF exists outside the home range radius of the owl. This MSA provides an important north-south habitat link for dispersal and genetic exchange. Extensive fragmentation in Corridor #2 identifies this area as a "red-flag" for rehabilitation. (See Figure 2-10) The owls are in the "take" category at both the 0.7 and 1.2 mile radii, with 39% NRF within 0.7 miles and 37% NRF within 1.2 miles.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Marten

Fragmentation

Within the MSA 30% currently exists as regenerated areas. Heavy fragmentation of the habitat has resulted from past harvest activities. Dispersing or foraging owls are vulnerable to predation via edge species such as the great horned owl. Fragmentation of the habitat has resulted from high road density.

Late and Old Structured Stands

Within the MSA 218 acres or 10% exists as LOS. The lack of LOS identifies this areas as a priority for enhancement activities.

ACRES OF LOS BY PAG

PAG	Acres
MCD Early	37
MCD Mid	54
MCD Late	53
MCW Late	74
TOTAL	218

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: lodgepole dry/mountain hemlock, mixed conifer wet, and mixed conifer dry.

Bryophytes -- MSA - S has low potential for habitat for listed bryophyte species.

Lichens -- There is low potential for habitat for listed lichen species in MSA - S.

Vascular Plants -- MSA - S has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are known sites for bull thistle in harvest units in MSA - S. There is potential for noxious weeds along roads.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- There is low potential for habitat for listed species in MSA - S.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	33%
Mixed Conifer Dry	64%
Lodgepole Dry/Mountain Hemlock	1%
Mountain Hemlock	2%

Summary of Trends

- The lodgepole pine and mountain hemlock areas have had little extensive management activity.
- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and through competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages.
- Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

•At present, 30% of this MSA has been entered with regeneration harvest activities.

Seral/Structural Stages

•Regeneration harvested stands are in the early seral/structural stages.
•The other harvested stands are in the late/old seral/structural stages.
•Approximately 29% of the area has suitable NRF habitat for spotted owls.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Except for shelterwood harvest areas, regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration. In shelterwood harvested areas there is a component of overmature trees left on site over the regenerated areas.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine PAGs and high severity in the mountain hemlock PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A large percentage of this area has had significant harvest activity.

Risk Analysis -- Moderate

Some significant lightning and human-caused ignitions have occurred within this area. A total of eleven fires have occurred in this MSA between 1940 and 1994, nine were lightning-caused and two were human-caused. Access to the area is high. The potential exists for an ignition start as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - S functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - S in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - S is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - S there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are also allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - S, EXISTING CONDITION

MSA - S

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole Dry/Mountain Hemlock, and Mountain Hemlock

Total Acres -- 2,128

Elevation Range -- 5,000 - 5,400

Land Allocation -- General Forest, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Northern Spotted Owl**, northern goshawk, pileated woodpecker, marten

Botanical -- Potential ALVI and CYMO habitat. Noxious weeds - bull thistle in regenerated units.

Fragmentation (%) -- Regenerated Areas - 30%, Road Density - high

LOS (%) -- 10%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 and 3 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- High (2)

Activities -- Matsutake mushroom known picking area, hunting

Commodities -- Commercial mushroom harvesting, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Emphasize management to accelerate development of LOS conditions in non-NRF forested areas in the MSA.

Rationale: Several conditions identify this MSA as an optimal area to utilize vegetative manipulation to enhance habitat. These conditions include: the MSA has little existing NRF or LOS habitat, therefore, manipulation can occur without jeopardizing existing habitat; is within the home range of an owl; and is a potentially important habitat link in the LSR. For these reasons, this MSA is a high priority for treatment.

- Allow natural processes to continue in forested and regenerated areas within the home range radius at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.
- Reduce fragmentation of habitat and potential disturbance to wildlife through travel and access management. (short and long-term)
- Provide habitat connectivity between Davis Mountain and Hamner and Ringo Buttes. (Short and Long-term)

Long-term (50+ years) --

- Maintain a minimum of 40% of the MSA in suitable LOS habitat for emphasis and selected species. (within the owl home range radius)

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

- Provide suitable LOS habitat in the remainder of the MSA outside the home range radius through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3. Manage stands in the mixed conifer PAGs to provide suitable NRF habitat conditions.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management within the home range radius is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐The recommended option for LOS stand management outside the home range radius is as follows: No silvicultural treatments are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels. (Short-term)

☐If the desired structural components are being lost at catastrophic levels within the owl home range or are in imminent risk of being lost outside the home range, treat according to the guidelines listed in Chapter 3 for the multi-story treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Maintain the function of the MSA as dispersal habitat. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.
Opportunity -- Treat bull thistle populations in regenerated areas.

Access

☐Reduce current levels of access and associated fragmentation.
Opportunity -- Subsoil closed roads, plant, and seed.

Monitoring

■Conduct annual monitoring of spotted owl activity. Monitor presence and determine reproductive success.

■Conduct a spatial and temporal owl prey base study. Monitor prey species diversity and density over time and among designated owl activity centers.

■Conduct surveys to confirm the presence and/or habitat utilization by the goshawk.

MSA T

MANAGEMENT STRATEGY AREA - T

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Documentation of owl use in the area exists from 1989-1995. Within the MSA 1,424 acres or 45% is currently NRF habitat. Owls are at the eastern extent of the species range and occupy the lowest quality "fringe" habitat in the LSR. Owls occupying habitat that is less than optimal may retain a genetic constitution that makes them more resilient. Maintaining this resiliency within the gene pool may be important to the long-term viability of the species. The owls are in the "take" category at both the 0.7 and 1.2 mile radii, with 41% NRF within 0.7 miles and 33% NRF within 1.2 miles.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Marten

Fragmentation

Habitat fragmentation is heavy (46%) in most of the MSA, however, two large (200-400) acre patches of habitat remain intact. Private land to the south of the MSA and Forest Service land to the north and east have been heavily harvested, and thus fragmentation of the surrounding landscape also impacts habitat effectiveness in this MSA. Fragmentation of the habitat from road density is high.

Late and Old Structured Stands

Within the MSA 692 acres or 22% exists as LOS and is primarily in the mixed conifer PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	168
LPH	31
MCD Early	13
MCD Mid	22
MCD Late	268
MCW Early	16
MCW Mid	129
MCW Late	33
PD	12
TOTAL	692

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: lodgepole dry/mountain hemlock, mixed conifer wet, and mixed conifer dry.

Bryophytes -- There is low potential for habitat for listed bryophyte species in MSA - T.

Lichens -- Low potential for habitat exists for listed lichen species in MSA - T.

Vascular Plants -- MSA - T has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are known sites for bull thistle in harvest units in MSA - T. There is potential for noxious weeds along roads.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed species exists in MSA - T.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	16%
Mixed Conifer Dry	76%
Lodgepole Pine High Elevation	1%
Lodgepole Pine Dry	6%
Ponderosa Pine Dry/Wet	1%

Summary of Trends

- The lodgepole pine areas have had little extensive management activity.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed

conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

- At present, 46% of this MSA has been entered with regeneration harvest activities.
- A portion of the 54% of the MSA that has not been regenerated harvested has been entered in isolated instances with some harvest activities.

Seral/Structural Stages

- Regeneration harvested stands are in the early seral/structural stages.
- The other harvested stands are in the late/old seral/structural stages.
- Approximately 45% of the area has suitable NRF habitat for spotted owls.

Canopy Cover

- *Regenerated Areas* – Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* – Regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs and low severity in the ponderosa pine PAG.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. The majority of this area has had significant harvest activity.

Risk Analysis -- Moderate

Some significant lightning and human-caused ignitions have occurred within this area. A total of twelve fires have occurred in this MSA between 1940 and 1994, ten were lightning-caused, and two were human-caused. Access to the area is high. The potential exists for an ignition start as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - T functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - T in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - T is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - T there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - T, EXISTING CONDITION

MSA - T

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry, and Ponderosa

Total Acres -- 3,166

Elevation Range -- 4,800-6,000

Land Allocation -- General Forest

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Northern Spotted Owl**, northern goshawk, pileated woodpecker, marten

Botanical -- Potential habitat for ALVI and CYMO. Noxious weeds -- bull thistle in regenerated units.

Fragmentation (%) -- Regenerated Areas - 46%, Road Density - high fragmentation

LOS (%) -- 22%, primarily in MCD and MCW

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 and 3 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- Moderate

Access -- High (2)

Activities -- Matsutake mushroom known, heavily picked, and prime picking areas, hunting

Commodities -- Commercial mushroom harvesting, wood products

Additional Information -- Adjacent private land - large areas of middle seral vegetation.

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels with the exception of a fuelbreak that will be created along the private boundary. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

Long-term (50+ years) --

- Maintain a minimum of 40% of the MSA in suitable LOS climatic-climax habitat for emphasis and selected species within the home range radius.

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

- Provide suitable LOS habitat throughout the remainder of the MSA to contribute to the overall desired LSR habitat conditions defined in Chapter 3. Manage stands in the mixed conifer PAGs to provide suitable NRF habitat conditions.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods

may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management within the owl home range radius is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐The recommended option for LOS stand management outside the owl home range radius is as follows: No silvicultural treatments are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels. (Short-term)

☐If the desired structural components are being lost within the owl home range radius or are in imminent danger of being lost at catastrophic levels outside the home range, treat according to the guidelines listed in Chapter 3 for the multi-story treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Opportunity -- Treat bull thistle populations in regenerated areas.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.

Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

Firewood

☐Seek opportunities to utilize personal use firewood collection within 150 feet of roads to reduce fire hazard within the following parameters:

-- Collection areas should be open on some, but not all, roads in the MSA; located in areas that biologists determine will not result in detrimental impact to LOS emphasis species; and designated and monitored to ensure that adequate snag and down wood is retained in these areas throughout time.

Fuelbreak

☐Reduce risk of catastrophic fire by creating a 200 foot fuelbreak adjacent to private land. Pursue agreements with adjacent landowners.

Monitor -- Private land to determine owl use.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of spotted owl activity. Monitor presence and reproductive success.

■Conduct a spatial and temporal owl prey base study. Monitor prey species diversity and density over time and among designated owl activity centers.

■Conduct surveys to confirm the presence and/or habitat utilization by the goshawk.

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MANAGEMENT STRATEGY AREA - U

Existing Condition

Wildlife

Emphasis Species -- Black-blacked Woodpecker

Decadent LOS stands in this MSA provide suitable habitat for black-backed woodpeckers.

Selected Other Species

- Marten - This MSA provides existing and potential habitat for marten and their prey species.
- Forest woodpeckers and other cavity nesters

Fragmentation

Habitat fragmentation due to past harvest occurs on 30% of the MSA. Road density is low, and there are minimal impacts.

Late and Old Structured Stands

Currently within the MSA 131 acres or 68% exists as LOS in the mountain hemlock PAG.

ACRES OF LOS BY PAG

PAG	Acres
MH	131
TOTAL	131

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: mountain hemlock, mixed conifer wet, and mixed conifer dry.

Bryophytes -- This MSA has low potential for habitat for listed bryophyte species.

Lichens -- Low potential for habitat for listed lichen species exists in MSA - U.

Vascular Plants -- MSA - U has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - U. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed species exists in MSA - U.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	6%
Mixed Conifer Dry	15%
Mountain Hemlock	79%

Summary of Trends

- The unharvested forested stands are in the middle of their seral development.
- Forested stands are moving towards later seral stages and their structures are becoming more complex.
- Susceptibility to stand replacement events caused by insects, disease, and fire is increasing at a slow rate.
- These stands are very stable and have a 600-1200 year cycle of stand replacement events.
- There are root rot pockets in the mountain hemlock stands nearby, but no pockets noted in this MSA to date. Pockets would be anticipated in these stands sometime in the next several decades or more.
- White pine blister rust is seriously reducing/eliminating western white pine viability as an invading species in the nearby root rot pockets.
- As discussed in the Odell Watershed Analysis, these stands seem to be functioning with little or no influence by man other than the white pine blister rust.

Harvest Areas

At present, 30% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Regenerated stands are in the early seral/structural stages.
•Forested stands are in the late/old seral/structural stages.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer PAGs and high severity in the mountain hemlock PAG.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A large percentage of this area has had significant harvest activity.

Risk Analysis -- Low

No lightning or human-caused ignitions have occurred within this area since 1940. Access to the area is relatively limited, however, the potential still exists for an ignition start from hunter use or other human activities.

Social Context

Reference to Odell WA

To understand how MSA - U functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - U in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - U is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - U there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are also allowed. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - U, EXISTING CONDITION

MSA - U

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, and Mountain Hemlock

Total Acres -- 192

Elevation Range -- 5,800 - 6,000

Land Allocation -- General Forest, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Black-backed Woodpecker,** marten, woodpeckers, cavity nesters

Botanical -- Potential ALVI and CYMO.

Fragmentation (%) -- Regenerated Areas - 30%, Road Density - low fragmentation

LOS (%) -- 68%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 (Odell WA)

Fire Risk -- Low

Fire Hazard -- High

Access -- Moderate (2)

Activities -- Matsutake mushroom known picking area, hunting

Commodities -- Commercial mushroom harvesting, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Provide viable mixed conifer and mountain hemlock LOS components through time. Stands should be managed to obtain or move towards the suitable habitat conditions described in Chapter 3.

Objective

•Provide a large patch of LOS to serve as optimal habitat for black-backed woodpeckers and other species with similar habitat needs. (Short and Long-term)

•Obtain a balance of sustainable and suitable habitat across the LSR as described in the desired condition chart in Chapter 3. The focus for this MSA is to provide suitable climatic-climax habitat in the short-term.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management is to allow natural processes to continue. No silvicultural treatments, including salvage and firewood collection, are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels. (Short-term)

Rationale: As discussed in the Odell Watershed Analysis, the majority of the stands in this MSA seem to be functioning with little or no influence by man other than the white pine blister rust. In addition, lack of LOS habitat and current fragmentation within the LSR make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and firewood collection would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are in imminent risk of being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the multistory treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Maintain a viable blister rust resistant western white pine component in the ecosystem for vegetative species diversity in root rot pockets. (Short and Long-term)

Opportunity -- Plant resistant strains of western white pine to counteract white pine blister rust.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.

Monitor -- For changes in fire occurrence.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization by black-backed woodpeckers.

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MANAGEMENT STRATEGY AREA - V

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Documentation of owl use in the area exists from 1977-1995. Within the MSA 1,821 acres or 61% is currently NRF habitat. This MSA currently functions as the most intact corridor for owl dispersal in the LSR. The owl is not in the "take" category within the 0.7 or 1.2 mile radii, with 58% NRF within 0.7 miles and 48% NRF within 1.2 miles. The area is highly functional at present as habitat for the northern spotted owl.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Neotropical migratory birds
- Nine acres within the BEMA

Fragmentation

Within the MSA 24% currently exists as regenerated areas. Fragmentation resulting from road density within this MSA is low, therefore, there are minimal impacts.

Late and Old Structured Stands

Within the MSA 1,336 acres or 45% exists as LOS. The majority of the managed stands were shelterwood harvested and still provide habitat for LOS associated species that utilize stands with more open structure.

ACRES OF LOS BY PAG

PAG	Acres
LD	2
MCD Early	224
MCD Mid	200
MCD Late	816
MCW Mid	94
TOTAL	1,336

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: mountain hemlock, lodgepole dry, mixed conifer wet, mixed conifer dry, and ponderosa pine.

Bryophytes -- MSA - V has low potential for habitat for listed bryophyte species.

Lichens -- There is low potential for habitat for listed lichen species in MSA - V.

Vascular Plants -- MSA - V has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - V. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed species exists in MSA -V.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	18%
Mixed Conifer Dry	82%
Other Incidental PAGs	<1%

Summary of Trends

- Forested stands are moving towards later seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where true fir and lodgepole pine are becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

•At present, 24% of this MSA has been entered with regeneration harvest activities.

Seral/Structural Stages

•Regeneration harvested stands are in the early seral/structural stages.
•The other harvested stands are in the late/old seral/structural stages.
•Approximately 61% of the area has suitable NRF habitat for spotted owls.

Canopy Cover

•*Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

•*Harvested Areas* -- Except for shelterwood harvest areas, regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration. In shelterwood harvested areas there is a component of overmature trees left on site over the regenerated areas.

Fire

Historic Fire Regime -- Moderate to high severity in the mixed conifer PAGs.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A moderate percentage of this area has had significant harvest activity.

Risk Analysis -- Moderate

Some significant lightning and human-caused ignitions have occurred within this area. A total of seven fires have occurred in this MSA between 1940 and 1994, five were lightning-caused and two were human-caused. Access to the area is moderate. The potential exists for an ignition start that may occur as a result of the accessibility.

Social Context

Reference to Odell WA

To understand how MSA - V functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - V in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - V is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - V there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - V, EXISTING CONDITION

MSA - V

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole Dry, Ponderosa, and Mountain Hemlock

Total Acres -- 2,968

Land Allocation -- General Forest, Scenic Views - R/FG, Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Northern Spotted Owl, northern goshawk, pileated woodpecker, NTMB's, BEMA

Botanical -- Potential ALVI and CYMO habitat.

Fragmentation (%) -- Regenerated Areas - 24%, Road Density - low fragmentation

LOS (%) -- 45%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- Moderate in south, low in north (2)

Activities -- Matsutake mushroom known picking area, hunting, Scenic Byway, big trees

Commodities -- Commercial mushroom harvesting, wood products

Additional Information -- One of the most intact mixed conifer LOS bands.

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Maintain a contiguous block of LOS forest to serve as optimal habitat for spotted owls and other species with similar habitat needs. (S and L)
- Emphasize reducing risk from outside the MSA.
- Allow natural processes, including insects and disease, to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.

Rationale: The MSA contains the most contiguous LOS mixed conifer habitat in the LSR that provides optimal habitat for the spotted owl and other selected species. The relatively unfragmented condition of this MSA makes it unique within the LSR and within the surrounding landscape. Based on the existing condition and uniqueness of this MSA, the team believed that the potential benefits of risk reduction measures may not justify lowering the quality of existing habitat at this time.

Long-term (50+ years) --

- Maintain a minimum of 40% of the MSA in suitable LOS climatic-climax habitat for emphasis and selected species.

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and disease, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands, using a variety of prescriptive methods, to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated

stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable in the short-term, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: This MSA contains the largest, contiguous expanse of spotted owl NRF in the LSR and surrounding landscape. It is also the most intact corridor for spotted owl dispersal in the LSR. This habitat currently serves a key connectivity function and exhibits few signs of declining stand health at this time. The contiguous character of this MSA, however, makes the habitat highly susceptible to certain insect and disease epidemics. The large tree component of these stands is considered to be particularly at risk. Silvicultural activities such as thinning could reduce the risk of losing this important habitat by creating breaks in the dense contiguous stands. This action would degrade the existing function of this area for the northern spotted owl and other species in the short-term.

The team recommends that the retention of the existing function of this MSA for the emphasis species is more important in the short-term than pursuing risk reduction activities. In other words, it is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for Scenario A - 90% UMZ, multistory treatment. The purpose of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Due to the limited number of roads within this MSA, inaccessibility, and the steepness of the terrain, dozers may be necessary. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Soils

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain, control, or eliminate encroaching lodgepole pine along the Scenic Byway (within 20 ft. of the road edge).

Rationale: Reduce the risk of fire and enhance the viewing of big trees. In addition, provide MIJE habitat.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of spotted owl activity. Monitor presence and reproductive success.

■Conduct a spatial and temporal owl prey base study. Monitor prey species diversity and density over time and among designated owl activity centers.

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MANAGEMENT STRATEGY AREA - W

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Almost all of the MSA is within the home range radius of the historic activity center. Documentation of owl use in the area exists from 1988-1990. No owls have been detected during periodic monitoring since 1990; this territory may no longer be occupied by spotted owls. The MSA is important because it provides a habitat link/dispersal corridor between Hamner Butte and Maklaks Mountain. Within the MSA 796 acres or 44% is currently NRF habitat, however, most of the habitat exists as narrow stringers and is not currently optimal habitat. Regenerated areas within the mixed conifer wet PAG are a high priority for "growth enhancement". Corridor #3 is also a high priority for treatment within this MSA. (See Figure 2-10) The owls are in the "take" category at both the 0.7 and 1.2 mile radii from the activity center, with 37% NRF within 0.7 miles and 36% within 1.2 miles.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Marten

Fragmentation

Within the MSA 47% currently exists as regenerated areas. Heavy fragmentation of the habitat has resulted from past harvest activities. The juxtaposition of the old harvest units is such that narrow stringers of habitat connect the larger patches of LOS habitat. Owls dispersing or foraging in these habitat stringers are vulnerable to predation via edge species such as the great horned owl. Moderate fragmentation of the habitat has resulted from road density.

Late and Old Structured Stands

Within the MSA 122 acres or 7% exists as LOS and is primarily in the mixed conifer dry PAG.

ACRES OF LOS BY PAG

PAG	Acres
LD	11
LW	1
MCD Early	3
MCD Mid	11
MCD Late	83
PD	13
TOTAL	122

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: lodgepole dry, mixed conifer wet, mixed conifer dry, and ponderosa pine.

Bryophytes -- This MSA has low potential for habitat for listed bryophyte species.

Lichens -- Low potential for habitat for listed lichen species exists in MSA - W.

Vascular Plants -- MSA - W has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - W. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- Low potential for habitat for listed species exists in MSA - W.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	16%
Mixed Conifer Dry	80%
Lodgepole Pine Dry	3%
Other Incidental PAGs	1%

Summary of Trends

- The lodgepole pine areas have had very little extensive management activity.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where true fir and lodgepole pine are becoming established and competing with the

overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

- At present, 47% of this MSA has been entered with regeneration harvest activities.

Seral/Structural Stages

- Regeneration harvested stands are in the early seral/structural stages.
- The other harvested stands are in the late/old seral/structural stages.
- Approximately 44% of the area has suitable NRF habitat for spotted owls.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- Regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs.

Hazard Analysis -- High

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. The majority of this area has had significant harvest activity.

Risk Analysis -- Moderate

Some lightning and human-caused ignitions have occurred within this area. Although this area has had only eight fires from 1940-1994, it is ranked as moderate in terms of risk due to the access to the area. The potential exists for an ignition start that may occur as a result of the high accessibility.

Social Context

Reference to Odell WA

To understand how MSA - W functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - W in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - W is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - W there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - W, EXISTING CONDITION

MSA - W

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole Dry, Lodgepole Wet, and Ponderosa

Total Acres -- 1,826

Elevation Range - 4,800 - 5,100

Land Allocation -- General Forest, Scenic Views - R/FG, Scenic Views - FG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Northern Spotted Owl**, northern goshawk, pileated woodpecker, marten

Botanical -- Known MIJE site, potential for ALVI and CYMO

Fragmentation (%) -- Regenerated Areas - 47%, Road Density - moderate fragmentation

LOS (%) -- 7%, primarily in MCD

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 4 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- High (2)

Activities -- Snowmobile trails criss-cross through the area, hunting

Commodities -- Wood products, firewood

Additional Information -- East - West habitat link for mixed conifer LOS species

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) --

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.
- Reduce fragmentation of habitat and consequent disturbance through travel and access management. (short and long-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures may not justify lowering the quality of existing habitat at this time.

- Provide habitat connectivity between the eastern and western halves of the LSR. (Short and Long-term)

Long-term (50+ years) --

- Maintain a minimum of 40% of the home range radius in suitable LOS climatic-climax habitat for emphasis and selected species.

Rationale: It is believed that the habitat within the home range radius can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

- Provide suitable LOS habitat throughout the remainder of the MSA to contribute to the overall desired LSR habitat conditions defined in Chapter 3. Manage stands in the mixed conifer PAGs to provide suitable NRF habitat conditions.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management within the spotted owl home range radius is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If the owl territory within this MSA is determined to be unoccupied following three additional years of surveys, silvicultural treatments to improve the quality of habitat, e.g. the multi-story treatment scenarios described in Chapter 3, may occur in existing NRF within this MSA. Stands selected for treatment should meet the following criteria:

- -- Reduce risk of fire and insects and disease outbreaks.
- -- Promote development of large tree structure.
- -- Treated NRF stands must remain functional as foraging habitat for spotted owls following treatment.
- -- Treatment of fuel accumulations should not further deteriorate LOS habitat structure.
- -- Utilize logging systems that minimize soil compaction and maximize snag retention. For example, it is preferable to use cable, aerial, and horse logging systems over ground-based systems.
- -- Within the treatment area canopy cover ≥ 50% should remain following harvest.

Monitor results -- Modify future treatments accordingly.

Rationale: These options were based on a synthesis of the team's professional judgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor – Overstory loss due to fire.

Monitor – For changes in fire occurrence.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Utilize existing native surface open/closed roads within potential MIJE areas to sustain and perpetuate MIJE populations.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor – Use of the MSA by forest carnivores.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of spotted owl activity. Monitor presence and reproductive success.

■Conduct surveys to confirm the presence and/or habitat utilization by the black-backed woodpecker and goshawk prior to treatment.

■Conduct winter track surveys to monitor marten use of slash piles.

K
L
X
MGA X

MANAGEMENT STRATEGY AREA - X

Existing Condition

Wildlife

Emphasis Species -- Species Associated with Riparian Habitat

Riparian vegetation along Odell Creek comprises a unique habitat type that is very limited and thus critical within the LSR. Species or species groups known or suspected to utilize the MSA include: elk, bats, great gray owls, Cascade frogs (and other amphibians), Preble's shrew, neotropical migratory birds, bald eagles, osprey, black-backed woodpeckers, marten, and bull trout (historical use). Many of the species supported by this habitat are PETS species.

The gravel pit and the associated travel and noise impact big game calving in this MSA and spotted owls in adjacent MSAs.

This MSA and adjoining MSAs in the lodgepole PAG provide the best existing and potential habitat for black-backed woodpeckers and species with similar habitat needs.

Selected Other Species

- Northern spotted owl - This MSA forms a habitat link between NRF habitat and activity centers on Hamner and McCool Buttes and Maklaks Mountain. Although the MSA is primarily in the lodgepole PAG and will never provide NRF habitat, it can serve as highly functional dispersal habitat.
- Tailed frog - Maklaks Creek provides existing habitat and confirmed sightings of this species.

Fragmentation

Fragmentation is low (12%). Neither road density nor past harvest activities have substantially altered this MSA or its functions.

Late and Old Structured Stands

Within the MSA 555 acres or 85% exists as LOS lodgepole.

ACRES OF LOS BY PAG

PAG	Acres
LD LW	486 69
TOTAL	555

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these

levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in the lodgepole dry and mixed conifer dry PAGs.

Bryophytes -- This MSA has high potential habitat for listed bryophyte species along Odell and Maklaks Creeks.

Lichens -- High potential habitat for listed lichen species exists along Odell and Maklaks Creeks in MSA - X.

Vascular Plants -- MSA - X has potential habitat for Candy Stick (*Allotropa virgata*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - X. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- High potential habitat for listed species exists along Odell and Maklaks Creeks in MSA - X.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	5%
Lodgepole Pine Dry	84%
Lodgepole Pine Moist/Wet	11%

Summary of Trends

- Presently the MSA is the main old-growth related species dispersal link between the Maklaks area and the Royce, Hamner, Davis, and Ringo areas.
- The lodgepole pine areas have had some extensive management activity and, because of beetle activity, are expected to remain in need of management activity into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved some of the lodgepole pine stands towards earlier seral stages.
- Stands dominated by large trees have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where lodgepole pine is becoming established and competing with the

overstory ponderosa pine to the point where much of the overstory is at risk of being lost to insects or competition.
•Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
•Mixed conifer dry stands where true firs are the prime component, thereby making makes them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 12% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.

Canopy Cover

•*Regenerated Areas* – Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. A portion of this area has had harvest activity.

Risk Analysis -- Low

Some lightning or human-caused ignitions have occurred within this area. A total of three fires have occurred in this MSA between 1940 and 1994, two were lightning-caused and one was human-caused. The potential exists for an ignition start to occur as a result of accessibility.

Social Context

Reference to Odell WA

To understand how MSA - X functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - X in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - X is included as part of the "Odell Creek" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - X there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - X, EXISTING CONDITION

MSA - X

PAG(s) -- Mixed Conifer Dry, Lodgepole Dry, and Lodgepole Wet

Total Acres -- 659

Elevation Range -- 4,500 - 5,200

Land Allocation -- General Forest, Scenic Views - PR/MG, Scenic Views - FG

Landscape Area(s) -- West and East Odell Creek; within the Odell Creek Key Watershed (Odell WA)

Wildlife -- Species Associated with Riparian Habitat, elk, bats, great gray owl, Cascade frog, tailed frog (and other amphibians), Preble's shrew, NTMB's, bald eagle, osprey, black-backed woodpecker, marten, bull trout (historical), northern spotted owl

Botanical -- Known MIJE site, potential ALVI habitat

Fragmentation (%) -- Regenerated Areas - 12%, Road Density - moderate

LOS (%) -- 85%

Insect and Disease Risk -- Moderate

Forest Density -- Moderate

Soil Restoration Priority -- Priority 4 (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- Moderate (2)

Activities -- Snowmobile trail traverses the area, dispersed camping, hunting, fishing

Commodities -- Firewood, wood products

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a sustainable LOS forest ecosystem through time that supports the diverse species associated with this MSA. Manage to provide and maintain a healthy riparian system according to the Aquatic Conservation Strategy. Refer to the Goals and Objectives listed for the West and East Odell Creek Landscape Areas in the Odell Pilot Watershed Analysis.

Objective

•Manage to provide and maintain a viable LOS lodgepole component in the area in order to provide a sustainable forest ecosystem. The LOS lodgepole should obtain or move towards the suitable habitat condition described in Chapter 3. Restore and maintain a habitat link (Corridor #3) to facilitate dispersal of spotted owls and other LOS species. (See Figure 2-10)

•Provide suitable LOS habitat in this MSA through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐Utilize vegetation management such as the various treatment scenarios described in Chapter 3 and/or uneven-aged management in some lodgepole pine stands outside riparian buffers to sustain live LOS in currently forested areas until the regenerated areas catch up. (Short-term)

Opportunity -- Utilize resultant wood fiber.

☐Utilize uneven-aged management techniques in the lodgepole pine stands outside riparian buffers to help ensure structural diversity suitable for dispersal of old growth related species such as the northern spotted owl. (Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Protect and enhance habitat for bull trout which is provided by the riparian areas and the forested stands surrounding them. Examples of activities that would be detrimental to bull trout habitat include:

activities that result in stream sedimentation and/or bank erosion, and activities that modify the overstory such that stream shade is decreased and water temperature is increased.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum in the short-term using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. Prevent losses to the adjacent MSA's from fire that starts in this MSA. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- Changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

☐Minimize impacts to riparian habitat.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

☐Use weed-seed-free-feed to prevent the introduction and spread of noxious weeds on the Metolius-Windigo Horse Trail.

☐Utilize existing native surface open/closed roads within potential MIJE areas to sustain and perpetuate MIJE populations.

Access

☐Do not increase access and seek opportunities to reduce roads and fragmentation in appropriate areas.

☐Maintain, control, or eliminate encroaching lodgepole pine along the Scenic Byway (20 feet).

Rationale: Reduce the risk of fire and enhance the viewing of big trees. Provide MIJE habitat.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization by goshawks, black-backed woodpeckers, and amphibians.

■Conduct down woody debris and snag censuses within LOS lodgepole to provide adequate information for the formulation of standards for these components in the lodgepole PAG.

BB
MSA Y

MANAGEMENT STRATEGY AREA - Y

Existing Condition

Wildlife

Emphasis Species -- Species Associated with Riparian Habitat

Riparian vegetation along Odell Creek comprises a unique habitat type that is very limited and thus critical within the LSR. Species or species groups known or suspected to utilize the MSA include: elk, bats, great gray owls, Cascade frogs (and other amphibians), Preble's shrew, neotropical migratory birds, bald eagles, osprey, black-backed woodpeckers, marten, and bull trout (historical use). Many of the species supported by this habitat are PETS species.

The MSA contains the following land allocations from the LRMP with specific standards and guidelines: Key Elk Area and Old Growth Management Area.

Selected Other Species

The MSA currently provides optimal habitat for black-backed woodpeckers and other species associated with down woody debris such as marten.

Fragmentation

This MSA has a low level of habitat fragmentation (9%) due to past harvest activities. Road density is low and past and potential impacts are minimal.

Late and Old Structured Stands

Within the MSA 2,011 acres or 81% exists as LOS and is primarily located within the lodgepole PAGs. This MSA represents the only large contiguous patch of LOS lodgepole in the LSR. In addition to providing riparian and meadow habitat, a large portion of this MSA is designated as an Old Growth Management Area (1,463 acres).

ACRES OF LOS BY PAG

PAG	Acres
LD	1560
LDMH	34
LPH	2
LW	408
MCD	5
MCW Late	1
MH	1
TOTAL	2,011

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in the regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: Mountain Hemlock, Lodgepole Dry/Mountain Hemlock, Lodgepole High Elevation, Lodgepole Dry, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- High potential habitat occurs along Odell Creek for listed bryophyte species.

Lichens -- There is high potential habitat for listed lichen species along Odell Creek in MSA - Y.

Vascular Plants -- MSA - Y has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- There are no known sites for noxious weeds in MSA - Y. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- High potential habitat for listed mollusk species occurs in riparian areas along Odell Creek.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Dry	2%
Lodgepole Dry/Mountain Hemlock	1%
Lodgepole Pine Dry	75%
Lodgepole Pine Moist/Wet	17%
Meadows	4%
Other Incidental PAGs	1%

Summary of Trends

•This MSA contains the majority of the relatively unentered lodgepole pine stands within the LSR.
•This MSA is heavily dissected by wet areas and meadows.
•The lodgepole pine areas have had little extensive management activity and, because of beetle activity, may be in need of management activity in the foreseeable future.
•Forested stands are moving towards later seral stages except where mountain pine beetles have moved some of the lodgepole pine stands towards earlier seral stages.
•Stands dominated by large trees have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material.
•Stand structures are becoming more complex as forested stands move towards later seral stages and as some lodgepole stands develop multiple layers as a result of beetle activity.
•Susceptibility to stand replacement events caused by insects, disease, and fire is increasing on most of the unharvested areas.
•Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 9% of this MSA has been entered with harvest activities.

Seral/Structural Stages

•Harvested stands are in the early seral/structural stages.
•Unentered stands are in the late/old seral/structural stages.

Canopy Cover

•*Regenerated Areas* – Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs; high severity in the mountain hemlock PAG; and low severity in the meadows.

Hazard Analysis -- Moderate

The dense understories and dog-hair thickets have created stress on older trees. The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Low

Some lightning or human-caused ignitions have occurred within this area. A total of three lightning fires have occurred in this MSA between 1940 and 1994. The potential exists for an ignition start to occur as a result of accessibility.

Social Context

Reference to Odell WA

To understand how MSA - Y functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - Y in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - Y is included as part of the "Odell Creek" area. Refer to pp. 2-23 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - Y motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed everywhere, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

Summary Table

MANAGEMENT STRATEGY AREA - Y, EXISTING CONDITION

MSA - Y

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Mountain Hemlock, and Meadow

Total Acres -- 2,490

Elevation Range -- 4,600 - 5,000

Land Allocation -- General Forest, Intensive Recreation, Old Growth, Scenic Views - PR/MG, Scenic Views - FG

Landscape Area(s) -- West Odell Creek; within the Odell Creek Key Watershed

Wildlife -- Species Associated with Riparian Habitat, elk, bats, great gray owl, Cascade frog (and other amphibians), Preble's shrew, NTMB's, bald eagle, osprey, black-backed woodpecker, marten, bull trout (historical use)

Botanical -- Potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 9%, Road Density - low

LOS (%) -- 81%

Insect and Disease Risk -- Moderate

Forest Density -- Moderate

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- Low

Fire Hazard -- Moderate

Access -- Low (7)

Activities -- Snowmobile trail is located along the southern boundary, hunting, dispersed camping, fishing

Commodities -- Wood products, firewood

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a sustainable LOS forest ecosystem through time that supports the diverse species associated with this MSA. Manage to provide and maintain a healthy riparian system according to the Aquatic Conservation Strategy. Refer to the Objectives listed for the West Odell Creek Landscape Area in the Odell Pilot Watershed Analysis.

Objective

•Reserve this area for the present and future benefit of riparian dependent species by allowing the continuation and conservation of natural processes below catastrophic levels.

•Manage to provide and maintain a viable LOS lodgepole component in the area in order to provide a sustainable forest ecosystem. The LOS lodgepole should obtain or move towards the suitable habitat condition described in Chapter 3.

•Provide suitable LOS habitat in this MSA through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

☐Maintain or enhance open meadows due to their uniqueness as a landscape feature.

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within this MSA is as follows: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: This MSA contains a unique habitat type that is limited across the landscape and thus critical within the LSR which makes any degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels, treat according to the guidelines listed under MSAs M or L. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Protect and enhance habitat for bull trout which is provided by the riparian areas and the forested stands surrounding them. Examples of activities that would be detrimental to bull trout habitat include: activities that result in stream sedimentation and/or bank erosion, and activities that modify the overstory such that stream shade is decreased and water temperature is increased.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor – Overstory loss due to fire.
Monitor – For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

☐Maintain the hydrologic function and integrity of the riparian area for wildlife, including movement corridors and areas for genetic transfer. In addition, maintain the water tables and subsurface flow.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Reduce and obliterate roads and trails that are not compatible with the objective while maintaining adequate access. Additional roaded access should not occur, since this would increase fragmentation.

Opportunity -- Obliterate roads within meadows that are not presently major travel corridors.

☐Funnel the north-south through-traffic around the West Odell Riparian Reserve areas while meeting the Recreation Opportunity Spectrum (ROS). The ROS for the majority of the area will shift from roaded modified to semi-primitive motorized.

☐Additional recreational use and access should not be encouraged within this riparian zone. Rehabilitation should occur on existing recreation sites or trails which have had undesirable effect(s) on riparian features or hydrologic function.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization by great gray owls, bats, and amphibians.

Y
MSA_Z

MANAGEMENT STRATEGY AREA - Z

Existing Condition

Wildlife

Emphasis Species -- Riparian Associated Species

The northern half of the MSA is a designated BECA and provides habitat for both the bald eagle and the osprey. Riparian and meadow vegetation provide potential habitat for a diversity of species in the MSA, including: bats, neotropical migratory birds, bull trout (historical use), big game, and possibly great gray owls.

Existing development and recreational use of this area by humans prohibits optimizing wildlife habitat for many LOS species, however, limitation of these human uses is neither desirable or feasible.

Selected Other Species

- The southern half of the MSA that is currently LOS lodgepole provides habitat for black-backed woodpeckers and other cavity nesters.
- Spotted owl - 72 acres or 12% of the MSA is NRF habitat.

Fragmentation

Fragmentation of the habitat from past harvest activities is low (7%). Road density is high, and there are considerable impacts to habitat effectiveness for many wildlife species as a result. Fragmentation and the potential for disturbance come from the following sources in the MSA: cross-country ski trails, snowmobile trails, an air strip, and a major highway that supports commercial and recreational traffic.

Late and Old Structured Stands

Currently within the MSA 337 acres or 56% exists as LOS. The LOS is primarily located within the lodgepole PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	258
LMW	46
MCD Mid	11
MCW Mid	6
MH	16
TOTAL	337

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: Mountain Hemlock, Lodgepole Dry, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- High potential habitat for listed bryophyte species is located in MSA - Z along Odell Creek.

Lichens -- There is high potential habitat for listed lichen species in MSA - Z along Odell Creek.

Vascular Plants -- MSA - Z has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are known sites for noxious weeds in MSA - Z along Highway 58.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- High potential for habitat for listed species exists in MSA - Z along Odell Creek.

Arthropods -- Survey Strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	2%
Mixed Conifer Dry	26%
Lodgepole Pine Dry	55%
Lodgepole Pine Moist/Wet	10%
Mountain Hemlock	6%
Meadows	1%

Summary of Trends

- Presently, this MSA is the main area of frequent human use in the LSR.
- Wet areas and meadows extensively bisect this MSA.
- The lodgepole pine areas have had little extensive management activity, and because of beetle activity, could be expected to become in need of management activity in the foreseeable future.

- Forested stands are moving towards later seral stages except where human activities and/or mountain pine beetles have moved some of the lodgepole pine stands towards earlier seral stages.
- Stands dominated by large trees have been reduced through both human activities and competition of overstory trees with ingrowth of smaller material.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as some lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 7% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.
- Approximately 12% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is beginning to close limiting forage and shade intolerant ground vegetation and tree species.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs; high severity in the mountain hemlock PAG; and low severity in the meadows.

Hazard Analysis -- Low

The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. Although there are no dense beds of ground fuels, under the right weather conditions, an ignition could cause a crown fire.

Risk Analysis -- Low

One lightning-caused fire has occurred within this area since 1940. The potential exists for an ignition start that may occur as a result of accessibility.

Social Context

Reference to Odell WA

To understand how MSA - Z functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - Z in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - Z is included as part of the "Willamette Pass-Odell Lake Area." Refer to pp. 2-18 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - Z motorized vehicles are allowed on all open roads; designated trails; and off roads and trails in designated areas only. Over snow vehicles are allowed. Bikes and other mechanized wheel vehicles are allowed on designated routes only. Cross-country skiing is allowed throughout the MSA, and horses are allowed on designated routes only. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 7.

State Highway 58 parallels MSA - Z and borders the community of Crescent Lake Junction. The MSA also includes a segment of the Mid-State Electric utility corridor and a state airstrip. An abandoned, snowmobile racetrack that was built at the site of a closed county dump site is also located within the MSA. There is a current proposal to route a snowmobile underpass beneath State Highway 58 within MSA - Z.

Summary Table

MANAGEMENT STRATEGY AREA - Z, EXISTING CONDITION

MSA - Z

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole Dry, Lodgepole Wet, Mountain Hemlock, and Meadows

Total Acres -- 597

Elevation Range -- 4,600 - 4,800

Land Allocation -- Intensive Recreation, Old Growth

Landscape Area(s) -- West Odell Creek and Odell Lake (Odell WA)

Wildlife -- Riparian Associated Species, bald eagle, osprey, bats, NTMB's, big game, great gray owl, black-backed woodpecker, other cavity nesters, bull trout (historic), northern spotted owl

Botanical -- Known MIJE site, potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 7%, Road Density - high fragmentation

LOS (%) -- 56%

Insect and Disease Risk -- Moderate

Forest Density -- Moderate

Soil Restoration Priority -- Priority 3 (Odell WA)

Fire Risk -- Low

Fire Hazard -- Low

Access -- High (7); State Highway 58 traverses area

Activities -- Industrial mushroom camp, cross-country skiing, snowmobiling, commercial traffic, historic county dumpsite, and snowmobile racetrack

Commodities -- State airstrip

Criteria for Developing Appropriate Treatments

Desired Condition

Provide a sustainable LOS forest ecosystem through time that supports the diverse species associated with this MSA. Manage to provide and maintain a healthy riparian system according to the Aquatic Conservation Strategy.

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Optimize habitat for emphasis and selected species to the greatest extent possible, within the limits of what is practical, given established infrastructure and human use.

Short-term (0-50 years) –

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas.
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels with the exception of creating a fuelbreak around the adjacent industrial mushroom camp. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.
- Mitigate the impacts of existing infrastructure and human uses.
- Maintain an area of low fire hazard as a buffer between the urban interface and adjacent MSA - Y.
- Manage to provide and maintain a viable LOS lodgepole component in the area in order to provide a sustainable forest ecosystem. The LOS lodgepole should obtain or move towards the suitable habitat condition described in Chapter 3.

Long-term (50+ years) –

- Provide suitable LOS habitat in this MSA through time to contribute to the overall desired LSR habitat conditions defined in Chapter 3.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

☐Rehabilitate and promote the accelerated development of LOS stands on the abandoned racetrack and disposal pit.

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management is as follows: No silvicultural treatments are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at a catastrophic level or unless fuel loading and the high risk for stand replacement events associated with human use are creating extreme fire risks for the adjacent MSAs. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the LSR make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures may not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are in imminent risk of being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

☐Protect and enhance habitat for bull trout which is provided by the riparian areas and the forested stands surrounding them. Examples of activities that would be detrimental to bull trout habitat include: activities that result in stream sedimentation and/or bank erosion, and activities that modify the overstory such that stream shade is decreased and water temperature is increased.

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

☐Create a 150 foot fuelbreak around the industrial mushroom camp if this use is to continue.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Seek opportunities to mitigate the impacts of existing non-neutral, non-beneficial infrastructures and human uses. For instance, ATVs, mountain bikes, and horses are not permitted in the riparian habitat.

☐Only neutral or beneficial new developments or human uses are appropriate in this MSA. The following is a list of projects proposed within the MSA with a recommendation of their appropriateness to occur within an LSR as made by the LSR team. Subsequent decisions should be addressed during the NEPA process:

-- Construction of a new snowpark within the LSR would cause potential negative impacts to LOS habitat and/or species and is not appropriate.

-- Construction of a snowmobile underpass under Highway 58 would have neutral impacts and is appropriate.

☐Reduce uses and infrastructure where practical.

Monitoring

■Conduct surveys for bats. Monitor use of bat boxes installed under bridges and in other appropriate locations. Determine bat use of infrastructure.

■Determine use of the MSA by forest carnivores.

■Determine use of the MSA by neotropical migratory birds.

W
BB
MSA AA

MANAGEMENT STRATEGY AREA - AA

Existing Condition

Wildlife

Emphasis Species -- Black-blacked Woodpecker

Decadent LOS stands in this MSA provide suitable habitat for black-backed woodpeckers.

Selected Other Species

- Marten - This MSA provides existing and potential habitat for marten and their prey species.
- Forest woodpeckers and other cavity nesters

Fragmentation

Within the MSA 38% currently exists as regenerated areas. Road density is high, however, the impacts to emphasis and selected species are minimal.

Late and Old Structured Stands

Currently within the MSA 156 acres or 45% exists as LOS and is located within the lodgepole PAGs.

ACRES OF LOS BY PAG

PAG	Acres
LD	133
LPH	23
TOTAL	156

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: Lodgepole High Elevation, Lodgepole Dry, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- This MSA has low potential for habitat for listed bryophytes.

Lichens -- Low potential for habitat identified for listed lichens exists in MSA - AA.

Vascular Plants -- MSA - AA has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*).

Noxious Weeds -- MSA - AA has known noxious weed sites along Highway 46.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- There is low potential for habitat for listed species in MSA - AA.

Arthropods -- Survey strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	8%
Mixed Conifer Dry	9%
Lodgepole Pine High Elevation	8%
Lodgepole Pine Dry	75%

Summary of Trends

- The lodgepole pine areas have had extensive management activity, and because of beetle activity, this trend can be expected to continue into the foreseeable future.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved some of the lodgepole pine stands towards earlier seral stages.
- Stands dominated by large trees have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as some lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacement events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

At present, 38% of this MSA has been entered with harvest activities.

Seral/Structural Stages

- Harvested stands are in the early seral/structural stages.
- Unentered stands are in the late/old seral/structural stages.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased. Although there are no dense beds of ground fuels, under the right weather conditions, an ignition could cause a crown fire.

Risk Analysis -- High

Some lightning and human-caused ignitions have occurred within this area. A total of two fires have occurred in this MSA between 1940 and 1994, one was lightning-caused, and the other was human-caused. The potential exists for an ignition start that may occur as a result of accessibility

Social Context

Reference to Odell WA

To understand how MSA - AA functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - AA in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR, and MSA - AA is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - AA there are few restrictions on access. Motorized vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - AA, EXISTING CONDITION

MSA - AA

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, and Lodgepole Dry

Total Acres -- 355

Elevation Range -- 4,600 - 4,800

Land Allocation -- General Forest, Scenic Views - R/FG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- **Black-backed Woodpecker**, marten, forest woodpeckers, other cavity nesters

Botanical -- Potential ALVI and CYMO habitat, noxious weeds

Fragmentation (%) -- Regenerated Areas - 38%, Road Density - high fragmentation

LOS (%) -- 45%

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- N/A (Odell WA)

Fire Risk -- High

Fire Hazard -- High

Access -- High (2)

Activities -- Hunting

Commodities -- Wood products, firewood

Criteria for Developing Appropriate Treatments

Desired Condition

Provide and maintain viable mixed conifer and lodgepole pine LOS components through time. Stands should be managed to obtain or move towards the suitable habitat conditions described in Chapter 3.

Objective

•Provide a contiguous block of LOS habitat to serve as optimal habitat for black-backed woodpeckers and other species with similar habitat needs.

•Obtain a balance of sustainable and suitable habitat across the LSR as described in the desired condition chart in Chapter 3.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for stand management within this MSA is to allow natural processes to continue. No silvicultural treatments are appropriate, including salvage and firewood collection, unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the LSR make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and firewood collection would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures do not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are in imminent risk of being lost at catastrophic levels, treat according to the guidelines listed in Chapter 3 for the various treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. (Short and Long-term)

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short and Long-term)

Monitor – Overstory loss due to fire.
Monitor – For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

Access

☐Maintain current levels of access.

Monitoring, Evaluation, and Research

■Conduct surveys to confirm the presence and/or habitat utilization by black-backed woodpeckers.

■Conduct winter track surveys to monitor marten use of slash piles.

46 RD.

MSA BB

MANAGEMENT STRATEGY AREA - BB

Existing Condition

Wildlife

Emphasis Species -- Northern Spotted Owl

This MSA contains a known activity center for a spotted owl pair. Documentation of owl use in the area exists from 1982-1995. Within the MSA 1,905 acres or 39% is currently NRF habitat. The MSA provides a home range territory in the western half and a habitat link/dispersal corridor (#4) in the eastern half. (See Figure 2-10) This MSA contains the largest amount of the mixed conifer wet PAG (approximately 50%), and thus has great potential for long-term maintenance of LOS. The owls are in the "take" category at both the 0.7 and 1.2 mile radii, with 36% NRF within 0.7 miles and 30% NRF within 1.2 miles.

Selected Other Species

- Northern goshawk and pileated woodpecker
- Black bear and white-headed woodpecker

Fragmentation

Within the MSA 27% currently exists as regenerated areas. Moderate fragmentation of the habitat has resulted from past harvest activities. A large block (600-800 acres) of contiguous habitat is located on the southern border of the MSA. Fragmentation of the habitat from road density is high.

Late and Old Structured Stands

Within the MSA 1,535 acres or 32% exists as LOS. LOS exists in a patchwork throughout the MSA.

ACRES OF LOS BY PAG

PAG	Acres
LD	45
LDMH	24
LPH	405
MCD Early	12
MCD Mid	55
MCD Late	347
MCW Early	26
MCW Mid	95
MCW Late	218
MH	308
TOTAL	1,535

Snags and Down Woody Debris

Existing levels of snags and down woody debris throughout the MSA, especially in regenerated areas, are most likely below the levels identified as providing suitable habitat (See Chapter 3). However, these levels are believed to be at least minimally suitable for a functional late or old structured ecosystem. The trend in untreated stands is currently moving towards the desired condition.

Botanical -- See Botanical section for additional information.

Fungi -- This MSA has potential habitat for fungi species listed in these PAGs: Mountain Hemlock, Lodgepole Dry/Mountain Hemlock, Lodgepole High Elevation, Mixed Conifer Wet, and Mixed Conifer Dry.

Bryophytes -- Potential habitat for listed bryophytes is located in springs at eastern edge of MSA - BB.

Lichens -- There is potential habitat for listed lichens around the springs.

Vascular Plants -- MSA - BB has potential habitat for Candy Stick (*Allotropa virgata*) and Mountain Ladyslipper (*Cypripedium montanum*). Jepson's monkeyflower (*Mimulus jepsonii*) occurs in this MSA.

Noxious Weeds -- There are no known sites for noxious weeds in MSA - BB. There is potential for noxious weeds along roads and in harvest units.

Invertebrates -- See Invertebrate section for additional information.

Mollusks -- This MSA has potential habitat for listed species in springs at the eastern edge.

Arthropods -- Survey strategy 4 applies to listed species.

Forest Dynamics

PAG(s)

PERCENTAGE OF MSA BY PAG

PAG	Percent
Mixed Conifer Wet	40%
Mixed Conifer Dry	33%
Lodgepole Pine High Elevation	10%
Lodgepole Dry/Mountain Hemlock	1%
Lodgepole Pine Dry	2%
Ponderosa Pine Dry/Wet	7%
Mountain Hemlock	7%

Summary of Trends

- The lodgepole pine and mountain hemlock areas have had extensive management activity.
- Forested stands are moving towards later seral stages except where mountain pine beetles have moved lodgepole pine stands towards earlier seral stages.
- Large-tree dominated stands have been reduced through both management activities and competition of overstory trees with ingrowth of pole-sized material. This trend is continuing, especially in the mixed conifer stands where lodgepole pine is becoming established and competing with the overstory ponderosa pine and Douglas-fir to the point where much of the overstory is at risk of being lost to insects or competition.
- Stand structures are becoming more complex as forested stands move towards later seral stages and as lodgepole stands develop multiple layers as a result of beetle activity.
- Susceptibility to stand replacement events due to insects, disease, and fire is increasing on most of the unharvested areas.
- Mixed conifer dry stands where true firs are the prime component, thereby making them desirable as LOS stands, are particularly at risk for stand replacment events from insects and disease. These ecosystems are unstable, highly susceptible to change events, and less resilient in responding/recovering from catastrophic events.

Harvest Areas

- At present, 31% of this MSA has been entered with regeneration harvest activities.

Seral/Structural Stages

- Regeneration harvested stands are in the early seral/structural stages.
- The other harvested stands are in the late/old seral/structural stages.
- Approximately 39% of the area has suitable NRF habitat for spotted owls. This implies old structure with either late or old seral stages.

Canopy Cover

- *Regenerated Areas* -- Canopy is uniform in stocking level and structure and is open allowing development of forage and shade intolerant ground vegetation and tree species.

- *Harvested Areas* -- Regenerated areas have mostly open canopies with some pole-sized material providing structure over the regeneration.

Fire

Historic Fire Regime -- Moderate to high severity in the lodgepole pine and mixed conifer PAGs, high severity in the mountain hemlock PAG, and low severity in the ponderosa pine PAG.

Hazard Analysis -- High

The vertical continuity of fuels is higher than historical levels, which allows surface fires to develop into understory or crown fires under less severe weather conditions. The average fire intensity is increasing, while the average fire tolerance of trees has decreased.

Risk Analysis -- Moderate

Some lightning or human-caused ignitions have occurred within this area. A total of twenty-four fires have occurred in this MSA between 1940 and 1994, twenty-two were lightning-caused, and two were human-caused. The potential for large-scale fire disturbance exists with the present fuel conditions. There is a large amount of lightning fire occurrence in the area and general accessibility from roads within this particular MSA is high.

Social Context

Reference to Odell WA

To understand how MSA - BB functions from a social perspective, refer the Odell Pilot Watershed Analysis which describes MSA - BB in terms of social expectations; human settlements influencing the MSA; the history of Forest Service management within the MSA; access and travel; scenic values; recreational use; commercial use and commodities; and heritage resources.

In the Odell Pilot Watershed Analysis, six geographic areas are spatially delineated on a map to illustrate the variety of social expectations placed on different areas for recreation, commodities, etc. These six areas also apply to the Davis LSR and MSA - BB is included as part of the "Stratovolcanoes" area. Refer to pp. 2-21 and 3-82 of the Odell Pilot Watershed Analysis for more information.

Access

Within MSA - BB there are few restrictions on access. Motorized-vehicles are allowed on all open roads; trails; and off roads and trails. Over snow vehicles, bikes, and other mechanized wheel vehicles are allowed throughout the MSA. Cross-country skiing and horses are also allowed everywhere. This information was obtained from the 1995-1996 Crescent Ranger District Travel Map and the travel opportunities and restrictions for Area 2.

Summary Table

MANAGEMENT STRATEGY AREA - BB, EXISTING CONDITION

MSA - BB

PAG(s) -- Mixed Conifer Wet, Mixed Conifer Dry, Lodgepole High Elevation, Lodgepole Dry/Mountain Hemlock, Lodgepole Dry, Ponderosa, and Mountain Hemlock

Total Acres -- 4,789

Elevation Range -- 4,600 - 5,900

Land Allocation -- General Forest, Scenic Views - R/FG, Scenic Views - PR/FG, and Scenic Views - PR/MG

Landscape Area(s) -- Central Conifer Association (Odell WA)

Wildlife -- Northern Spotted Owl, northern goshawk, pileated woodpecker, black bear, white-headed woodpecker

Botanical -- Known MIJE site, potential ALVI and CYMO habitat

Fragmentation (%) -- Regenerated Areas - 27%, Road Density - high fragmentation

LOS (%) -- 32%, patchwork

Insect and Disease Risk -- High

Forest Density -- High

Soil Restoration Priority -- Priority 2 and 3 (Odell WA)

Fire Risk -- Moderate

Fire Hazard -- High

Access -- High (2)

Activities -- Snowmobile trail is located along northern boundary, hunting, probable mushroom harvesting, Scenic Byway, driving/snowmobiling for pleasure

Commodities -- Wood products

Additional Information -- Springs located on eastern edge of MSA.

Criteria for Developing Appropriate Treatments

Desired Condition

Maintain a contiguous, multi-storied, forested condition throughout the MSA. Stands should be managed to obtain or move towards the conditions identified in the NRF description located at the beginning of this chapter and the mixed conifer climatic-climax suitable habitat descriptions located in Chapter 3.

Objective

Short-term (0-50 years) –

- Reduce fragmentation as soon as possible and accelerate development of LOS conditions within regenerated areas. (throughout entire MSA)
- Allow natural processes to continue in forested and regenerated areas at less than catastrophic levels. In other words, do not utilize risk reduction measures such as salvage and thinning until such time that it is determined that the ability of the MSA to function as habitat for the emphasis species may be in jeopardy.
- Reduce fragmentation of habitat and consequent disturbance through travel and access management (short and long-term)
- Manage lodgepole pine to function as dispersal habitat for spotted owls. (Short and Long-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures may not justify lowering the quality of existing habitat at this time.

- Reduce risk of owl habitat loss and enhance habitat for flammulated owls and white-headed woodpeckers in the area outside the home range radius of the spotted owl, connectivity corridor and NRF.

Rationale: Maintain large overstory trees in healthy condition to facilitate resistance to damage agents and resilience and to provide habitat in the long-term for emphasis species in the areas that are not currently NRF.

Long-term (50+ years) –

- Maintain a minimum of 40% of the MSA in suitable LOS habitat for emphasis and selected species. (within the owl home range radius)

Rationale: It is believed that this MSA can sustain between 40-60% in suitable LOS mixed conifer dry and wet climatic-climax condition. This determination was based on the site potential, percentage of mixed conifer wet within the MSA, and existing and desired condition for both the mixed conifer wet and dry PAGs. The majority of potential habitat within the home range of a known owl pair occurs within this MSA, thus it is desirable to maintain a high percentage of the area in LOS throughout time. Maintaining between 40-60% LOS was recommended, because the team believed that natural processes, i.e. fire, insects and diseases, would preclude maintaining a higher percentage of suitable habitat over an extended period of time.

- Manage for fire-climax LOS in the ponderosa pine PAG while maintaining NRF habitat function in the short-term.

Rationale: Because only 3% of the LSR exists in the ponderosa pine PAG, the team believed it was appropriate to manage for LOS species that utilize the fire-climax pine habitat type in the long-term when additional NRF habitat exists in the MSA, rather than to manage for climatic-climax habitat utilized by spotted owls.

Management Options

Management of Regenerated Areas

☐Emphasize management of regenerated stands to accelerate growth as a means to return to LOS more quickly. Refer to the LOS Enhancement Strategies section located in Chapter 3 which describes appropriate treatments for accelerating growth in regenerated stands. Deviations from these methods may occur on a site-specific basis to meet specific wildlife objectives, e.g. hiding cover in deer and elk fawning and calving grounds. (Short and Long-term)

Management of Forested Areas

☐In areas of the MSA where the Desired Condition exists and is believed to be sustainable, no treatment is recommended at this time. (Short-term)

☐The recommended option for LOS stand management outside the owl home range radius is as follows: No silvicultural treatments are appropriate unless stands are determined to be in imminent risk of losing the desired structural components at catastrophic levels. (Short-term)

☐Within the home range radius the recommendation for stand management is: No silvicultural treatments are appropriate unless stands begin to lose the desired structural components at catastrophic levels. (Short-term)

Rationale: Lack of LOS habitat and current fragmentation within the MSA make further degradation of habitat undesirable in the short-term. Known preventive measures for stand replacement events such as salvage and thinning would further degrade habitat for emphasis species. It is believed that the potential benefits of risk reduction measures may not justify lowering the quality of existing habitat at this time.

☐If the desired structural components are being lost at catastrophic levels within the home range radius or in imminent risk of being lost outside the home range radius, treat according to the guidelines listed in Chapter 3 for the multistory treatment scenarios. The purposes of the treatment would be to ensure the protection and enhancement of late successional and old growth conditions and to increase resistance to and resilience from insects, disease, and fire events. If treatment does occur, all NRF stands must remain functional foraging habitat for spotted owls throughout time.(Short and Long-term)

☐In lodgepole pine stands, consider uneven-aged management techniques to help ensure structural diversity suitable for dispersal of old-growth related species such as the northern spotted owl.

☐The majority of silvicultural treatments to reduce risk and promote development of large tree structure should focus on the areas not currently in NRF during the next two decades. Where treatment does occur the following apply:

- Treatment of fuel accumulations should not further deteriorate LOS habitat structure.
- Utilize logging systems that minimize soil compaction and maximize snag retention. For example, it is preferable to use cable, aerial, and horse logging systems over ground-based systems.

-- Within the treatment area canopy cover ≥ 50% should remain following harvest.
Monitor Results -- Modify future treatments accordingly.

Rationale: These options were based on a synthesis of the team's professional judgement. We believe these conditions will provide a good mix of maintaining options and providing for biodiversity. Modifications on the standards may occur as research and site-specific information become available.

☐If catastrophic loss of habitat does occur, treat to enhance and obtain LOS habitat characteristics as described in Chapter 3 - Suitable Habitat Condition. (Short and Long-term)

Snags and Down Woody Debris

☐Within the context of individual stand site potential, maintain coarse woody debris and snags at levels indicated in the Suitable Habitat Condition tables and Additional Guidance for Dead Wood Management section located in Chapter 3. (Short and Long-term)

Fire Suppression

☐Use appropriate suppression strategies (confine, contain, control) to keep all fires regardless of intensity to a 100 acre maximum using the least aggressive ground-disturbing tactics in the safest manner. For example: aerial suppression is preferable to a dozer line. Use adaptive management as the stand conditions change. (Short-term) Suppression tactics may vary for ponderosa pine fire-climax as determined by adaptive management (Long-term).
Monitor -- Overstory loss due to fire.
Monitor -- For changes in fire occurrence.

Riparian Areas

☐Manage areas consistent with the Aquatic Conservation Strategy and Odell Pilot Watershed Analysis.

Soils

☐Restore soils according to the priorities determined in the Odell Pilot Watershed Analysis.

☐Protect and enhance long-term site productivity. (Short and Long-term)

Wildlife and Botanical

☐Habitat protection takes precedence over the protection of individual plants or animals with the exception of known sites of species listed in Table C-3 of the Northwest Forest Plan.

☐Prevent, eradicate, or control noxious weed populations using current vegetative management guidelines.

☐Utilize existing native surface open/closed roads within potential MIJE areas to sustain and perpetuate MIJE populations.

Access

☐Maintain current levels of access, including trails, unless monitoring indicates that they have detrimental impacts to LOS plant and/or animal species.

Monitor -- Use of the MSA by forest carnivores.
Monitor -- Motorized winter use, i.e. ATVs and snowmobiles.

☐Maintain, control, or eliminate encroaching lodgepole pine along the Scenic Byway (within 20 ft. of the edge of the road).

Rationale: Reduce the risk of fire and enhance viewing of big trees, and in addition provide MIJE habitat.

Monitoring, Evaluation, and Research

■Conduct annual monitoring of spotted owl activity. Monitor presence and reproductive success.

■Survey for the presence of forest carnivores, primarily fisher and wolverine. If presence is confirmed, initiate a habitat utilization study and an evaluation of human use on this utilization.

■Conduct surveys to confirm the presence and/or habitat utilization by white-headed woodpeckers and goshawk.

APPENDIX

WHITE PAPER
Definition and Procedures for Classifying Stands as Imminently Susceptible to Insect Attack and Wildfire
(May 8, 1996)

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WHAT IS IMMINENTLY SUSCEPTIBLE?

We propose that a stand be classed as imminently susceptible when:

> **its condition is such that it is very likely to experience significant change in structure or character as a result of insect attack and/or fire within a relatively short timeframe (within the next one or two decades).**

Especially important are changes in stand structure and character which do not support overall ecosystem health and viability. Significant change can take a number of forms. A stand may be losing so many overstory trees to insect attack that it loses its old growth character. In the drier mixed conifer- or ponderosa pine settings, significant change can be the loss of an overly dense stand via a stand replacement fire. Significant change may also occur in stands when defoliator or bark beetle epidemics produce high levels of tree mortality which also increases the risk of high intensity, soil damaging fires. If one or more of these changes are likely to occur, then the stand in question will be characterized as "imminently susceptible".

PROCEDURES FOR DETERMINING IMMINENT SUSCEPTIBILTY

Procedures to classify a stand as "imminently susceptible" to insect attack or wildfire will be initially based on the published risk and hazard rating systems which are most applicable to eastern Oregon. These should be refined, where appropriate, using local knowledge and field data. The underlying intent of this determination will be to identify stands where proactive treatment can protect existing resources (e.g. sustainable wildlife habitat, wood products, scenic and recreational values).

General characteristics of hazard and risk rating systems. Hazard/risk classification systems are tools used by forest managers to predict future insect or fire activity relative to the location of a forest stand and conditions within that stand.

It is important to understand that risk/hazard models are not intended to precisely reproduce the complexity of nature, but rather to identify and relate key biological features which may have predictive value (Bentz et al, 1993). Thus, risk/hazard projections may not accurately predict a specific scenario for a stand or an area, only likely scenarios. Just because a stand is at high risk "i.e. imminently susceptible" to insect attack or wildfire does not mean it will surely happen; only that it is very likely to happen.

Procedures for classifying stands imminently susceptible to insect attack.

Bark beetles. The following conditions characterize stands that, under the proposed definition, are imminently susceptible to bark beetle attack. These descriptions were developed by Pat Cochran (Research Scientist, PNW), from pertinent published literature, and his research over the past decades correlating stocking level densities, stand growth and development and bark beetle attack in the forests of Central Oregon. Cochran identifies an upper management zone of stocking for major plant associations that cover a broad range in site productivity. The upper management zone for a given plant association represents the point at which tree mortality begins to occur due to competition for site resources. Cochran's recommended stand density cutoff points are based on the assumption of "average weather conditions". If the next decade or so has more moisture than average then stands can carry higher densities before experiencing this reduction in stocking. If conditions are drier than average, less stocking density can be maintained. Since future weather patterns cannot be predicted with any degree of accuracy, we are assuming the average condition will prevail.

Changes due to density-dependent agents can occur in any stand which is stocked above the "upper management zone" described by Cochran. In determining relative levels of susceptibility, we make the assumption that stands far above the "upper management zone" are 1) more likely to experience the change, and 2) are likely to experience more dramatic changes than stands less densely stocked. Stand Density Indices and their associated stocking curves should be derived from the appropriate plant associations listed in PNW-RN-513 (Cochran et al, 1994). Some plant associations are specific to Central Oregon and will not be listed in Cochran's publication. In such cases, the productivity levels of the local associations can be compared to similar associations in Cochran's publication in order to choose the appropriate stocking level curve. Cochran's logic and equations can also be used to determine similar stand density indices and their associated stocking curves for major Central Oregon plant associations. These have just been developed for the Deschutes NF by Jo Booser (Forest Silviculturist) and are available upon request.

Ponderosa pine stands--If stands are stocked above the upper management zone as per Cochran's stocking curves (PNW-RN-513), they are at imminent susceptibility. For sites above Barrett's Site Index 110, the upper management zone would be at 75% of normal Stand Density Index. (For sites lower than Barrett's Site Index 110, the upper management zone is determined by the formula UMZ = 365 (-0.36 + 0.01[S]) where S is Barrett's site index value). The greater the stocking above this upper management zone threshold, the greater the susceptibility to density-dependent agents of change such as bark beetles. Existence of dwarf mistletoe in the stand, or presence of recent bark beetle attacks also increases the likelihood of future change within the stand. In such cases, even stands below the upper management zone may be imminently susceptible due to a combination of density, mistletoe, and the resident bark beetle population.

Lodgepole pine stands--If the Stand Density Index (SDI) is above 170 and there are some trees 9 inches dbh and greater in the stand, then there is a high probability of serious mortality in that stand within the next decade. Applying Cochran's equations to drier lodgepole plant associations in central Oregon shows that these stands can experience serious mortality at SDI's below 170.

Mixed conifer stands--ponderosa pine component. Often these stands have an overstory of mature ponderosa pine which comprises an important part of the stand structure, together with a dense understory of fir. In these stands imminent susceptibility is defined as the upper management zone of the species that requires the most growing space (in this case, the ponderosa pine) (Cochran et al, 1994).

Mixed conifer stands--white fir component. The prediction of fir engraver epidemics has traditionally been based on the assumption that overstocking triggers significant mortality levels in a stand. However, recent monitoring within thinned plots in Central Oregon indicates that additional factors may be operating. In areas of high fir engraver activity, thinned stands are still attacked. While there appears to be a positive linear correlation between tree mortality and stand density, these results seem to indicate that over the long term you may not be able to manage white fir as a dominant component of the stand on drier sites where annual rainfall is between 20 and 30 inches.

Fir engraver epidemics are often triggered by periods of drought. An examination of weather patterns in this century show that a 6-year (or longer) drought has occurred every 30 years or so. Thus, if entries are made every 20 years, there is almost an even chance that there will be a drought within that timeframe.

In this situation, the distribution of white fir should be examined in the landscape context. If host type is distributed over a significant amount of the area, there is significant risk of serious mortality in drier years as a result of fir engraver. The greater the density of these stands, the greater the magnitude of the risk. The key point to consider here is the inherent instability of fir-dominated stands on dry sites and to judge accordingly how much of the landscape to manage in that condition.

Defoliating insects. Stands can also be evaluated for imminent susceptibility to defoliating insects which selectively affect certain host species. Stands where various species of white fir and/or Douglas-fir are the major overstory component should be evaluated for imminent susceptibility using "Silviculture Strategies To Reduce Stand and Forest Susceptibility to the Western Spruce Budworm, USDA Handbook No. 676, Carlson, Clinton E. and N. William Wulf, 1977. This rating considers many factors such as density, species composition, structure, vigor, and stand maturity. In addition to evaluating susceptiblity to spruce budworm, this western spruce budworm hazard rating system can also act as a surrogate rating system for most other foliage feeding insects that damage true firs and Douglas-fir. Although this hazard rating system has not been validated for central Oregon, it does consider many of the variables which we believe are important in defining risk to spruce budworm and associated insects. A stand receiving a rating of "high" (more than 50) should be considered at imminent risk.

Further questions on insect risk/hazard rating systems may be directed to Pat Cochran (541-383-5436) or Andy Eglitis (541-383-5701).

Characteristics of stands at imminent susceptibility to wildfire.

Wildfire occurs when environmental conditions are favorable for the spread of fire, given an ignition. The collective presence of these conditions is often referred to as the "fire environment". The components of the fire environment are defined as fuels, topography and weather. The intensity, ecological effect and resistance to control of any wildfire is the ultimate result of the sum of the three components. Of the three components, only fuels can be altered by humans.

Stands with the highest susceptibility to stand replacement or other dramatic change from wildfire, are those stands which have reached a successional stage with sufficient down woody debris, dense understory vegetation and a vertical continuity to allow fire to quickly enter the canopy. This condition can be intensified by the presence of mortality from insects and/or disease. The susceptibility of the stand to crown fire is increased until needles are dropped following a mortality incident.

The three-dimensional characteristics of a fuel profile have much to do with the probability of a stand replacement fire. Accumulation of large, woody debris leads to higher fire intensity and extended heat

duration. Where these fuels burn under dense canopy, crown scorch occurs even during the residual combustion phase, often hours after the flaming front has moved on. When the canopy is dense enough and the surface fire is intense enough, fire will move into the canopy as a crown fire. The cool, dry climate of south and Central Oregon forests make decomposition of large wood debris a slow process. The susceptibility of a given stand to high intensity wildfire varies as a result of its history, natural or human-influenced. Conditions for the start of a crown fire are surface fire intensity, height to base of crown and foliar moisture (Van Wagner, 1977).

Procedures for characterizing stands at imminent susceptibility to wildfire.

Fire Management professionals identify fire susceptibility of a particular area, or region in terms of risk and hazard. Risk applies to the probability of an ignition occurring. Hazard identifies the availability of fuels to sustain a fire. When defining imminent susceptibility, risk is defined by human use patterns or fire occurrence. Where high risk coincides with high hazard, the probability of an intense fire is more likely. Without an actual fire occurrence, risk merely exists.

Hazard, in the case of imminent susceptibility to wildfire, includes all elements that influence size and intensity of a fire. Critical elements are: fuel profile (loading, arrangement, continuity) and moisture. Weather factors play a role, yet weather is highly variable. Over the course of time, a stand that has supported large damaging fires will, in fact, be exposed to future ignitions and weather factors which result in sustained combustion. If we agree that variables such as weather and risk of ignition will, at some point, both align at levels that will initiate combustion and sustain fire spread, then the only important variables remaining deal specifically with dynamics that influence fire size and intensity, fuel profile and topography, and fire return interval.

Fuel profile. Three of the most important fuel types that promote large scale disturbances are surface fuels, ladder fuels and crown fuels. Fuel models have been identified with respect to fuels properties as inputs to calculations of fire danger indices or fire behavior potential (Anderson, 1982). We suggest this be used as the guide when rating surface fuel hazard. Photo series for appraising slash, quantifying forest residues and fuels are also useful (Maxwell and Ward, 1979; Blonski and Schramel, 1981; Fischer, 1981). In addition, Brown's Planar Intersect (Brown, 1974) and the R6 Fuels Appraisal Process (FAP) are commonly used in fuels inventory.

Favorable conditions for a crown fire include (Rothermel, 1991):

-dry fuels
-low humidity and high temperatures
-heavy accumulations of dead and downed litter
-conifer reproduction and other ladder fuels
-steep slope
-strong winds
-unstable atmosphere
-continuous forest of conifer trees

Key factors affecting the risk of crown fire include: 1) crown density; 2) ladder fuels; 3) chemical content of the fuels; 4) crown decadence. Some (but by no means all) measurable variables representing these factors include: 1) crown density = variables denoting stocking levels (e.g. trees/acre, basal area/acre); 2) ladder fuels = crown height; 3) chemical content = plant species; 4) level of decadence = percent mortality, imminent susceptibility to insect attack. Specific guidelines relating specific levels or quantities of these variables to high susceptibility to crown fire have not been formally published. However, general 'rules of thumb' for eastern Oregon are displayed in Figure 1 (at the end of this White Paper).

Topography. Slope is the primary topographic feature that affects fire potential. In brief, slopes over 50% greatly increase crown fire potential. Like stands which have abundant ladder fuels (e.g. overstocked stands), as slope increases so does the potential to transfer a surface fire into the canopy and thus generate a rolling, sustained crown fire. This is due to the flame length becoming closer to the canopy due to angle of slope and increased preheating of aerial vegetation due to convection (Rothermel, 1991).

Analytical Tools. To facilitate identification and display of areas at imminent susceptibility to wildfire, we suggest maps be produced which delineate and rate the landscape of interest. Ratings should remain simple utilizing high, moderate and low adjectives to distinguish like areas. Brown's Planar Intersect system (Brown, 1974) is intended to be applied to specific locations where pre-activity fuel loading and post activity fuel loading are estimated, predicted, analyzed and treatment standards developed to reduce stand susceptibility to wildfire.

Several efforts are underway to customize utility of fire and fuels modeling with respect to crown fire potential, susceptibility and consequences of large scale disturbances. In Northeastern Oregon, the Large Fire Susceptibility Mapping Project defined a procedure to produce maps of Northeastern Oregon forests showing susceptibility of the stands to a significant fire event. In Central Oregon, a fire/fuels and GIS group is currently developing a process, and ultimately, a GIS layer which maps crown fire potential. The matrix and supporting documentation will be available by mid-April 1996. With the aid of this information, fuels management specialists and managers alike can identify forest vegetative communities, especially timber stands, that are at risk of being lost to large damaging wildfires. By identifying and displaying stands that are "imminently susceptible" to loss from wildfire, they can prioritize treatment areas, determine treatment levels, and graphically view consequences of project level decisions.

Final Comments. It should be noted that when a stand or area is determined to be at risk of a large scale disturbance, the circumstances that have generated the hazard have normally been present many years prior to the fire hazard becoming obvious. Those factors that begin moving a stand toward imminent susceptibility from fire include insect attack, disease, storm damage and fire exclusion. Thus predicting and/or identifying imminent susceptibility from fire really is a process for scientists, and foresters to detect in early stages, long before a stand reaches a condition that places it at risk from fire.

Factors which contribute to imminent susceptibility are of concern to fire managers with regard to extreme fire behavior. Once a surface fire escalates to a crown fire, fire suppression options are limited. Aerial retardant and even large dozer firelines can be ineffective once an independent crown fire develops. In this instance, higher mortality to vegetation is a concern, as is unacceptable loss of other resources. One final note of significance relates to firefighter safety. Where stands remain untreated, after identification of imminent susceptibility, firefighter safety must remain our primary concern in both fuels planning and fireline decisions.

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Figure 1: *Conditions Indicating Susceptibility to Crown fires.*
(From: National Fire ES 2285. (S490) 1993.)

1. Spacing - Obviously crowns in close proximity are more susceptible to sustaining crown fires than wide spacing.

    a. Twenty feet or less between crowns seems to be a good indicator of potential.

    b. Stocking levels greater than 100 trees per acre seem to create close spacing and therefore, a higher potential.

    c. Crown closure of 75% or more also indicates a high potential. Crown closure less than 75% will not sustain active or independent crowning on flat terrain.

2. Ladder fuels - Ladder fuels add substantially to the fire's ability to transfer flames into the crowns. Crown height is an important estimate of potential, the lower the crown height, the greater potential. Crown height is also referred to as height to live crown base.

3. Chemical content.

    a. Obviously volatiles will influence crowning. Be familiar with your local plant species and when on assignment consult with a local fuels person.

4. Surface conditions

    a. Loading - Crown fires require a strong surface fire to initiate, and sometimes (active, passive) propagate. So heavy loading, especially in the 0 to 3 inch material, substantially add to the ability to crown.

DESIRED LATE SUCCESSIONAL RESERVE CONDITION

INTRODUCTION

According to the Northwest Forest Plan, the objective for Late Successional Reserves (LSRs) is to protect and maintain late successional and old growth habitats for the species dependent or are associated with them, including the northern spotted owl. However, the functional structural elements (snags/logs, canopy cover, canopy layers, size structure and any other special features) of this habitat have not been described. These descriptions have been left to individual Forests and ID teams to develop so that they could be appropriately site specific.

For many dry eastside plant associations, the very stand characteristics that define suitable habitat conditions for climatic climax late successional old growth dependent and associated species are often unsustainable. This is because these conditions have high susceptibility to epidemic insect attack and catastrophic wildfire. Thus, "protecting and maintaining" as much of this habitat as we can in the short term leads to not being able to maintain it in the long term. Since long term maintenance of late successional old growth habitat, distributed functionally across the landscape is essential for species viability, the dilemma of maintaining habitat conditions in the short term versus a continual supply of suitable habitat for the long term needs to be addressed.

The intent of the paper is to provide information in three topic areas to assist the Deschutes National Forest Late Successional Reserve Assessment teams while addressing the above issues in their analysis efforts:

First, specific descriptions of structural elements which comprise suitable habitat (both in terms of fire climax and climatic climax) will be provided for late successional old growth dependent and associated species for plant association groups (PAGs) specific to the Deschutes NF. The intent of these descriptions for suitable habitat is to present a range of conditions that provide habitat for successful reproduction and dispersal of young. They are not meant to be minimum habitat conditions.

Second, density levels and fuel profiles for suitable habitat conditions will be compared to density levels and fuel profiles required to sustain the stand (or landscape) over the long term. The degree of over lap between these two conditions will be clearly displayed.

Third, where there is little or no overlap between suitable habitat and sustainable vegetative conditions, a process for, as well as a prototype of "desired apportioning of successional stages", by plant association group will be provided. This apportioning seems to assure, at least to the best of our ability to analyze it, a continued supply of late successional old growth habitat in our LSRs over time.

DEFINITION OF LATE SUCCESSIONAL HABITAT

If we are to manage the LSRs to protect and maintain late successional old growth forests, it is critical that we have a clear understanding of what the term "late successional old growth" means in terms of the vegetation on the Deschutes NF. In otherwords, what types of forest structures and associated characteristics are we labeling as suitable late successional old growth habitat? A clear definition of the desired condition will result in more effective communication and evaluation of our efforts.

In the frequent fire adapted forests of the east Cascades, we (the science team) propose that there are actually two types of late successional old growth forests: climatic climax forests and fire climax forests. These two

states are very different both in terms of the species that use them and their relative sustainability. Thus, descriptions of specific key structural characteristics need to be provided for both types of conditions.

> Climatic climax forests develop in the absence of fire. These forests are characterized by dense stands dominated by climax species (true fir and Douglas-fir on mixed conifer sites), but early seral species may be dominate in the overstory for a period of time, until high densities of late seral species use most of the moisture and nutrients so the early seral species cannot survive. All size classes are usually present and understories are often very dense. This climax community takes a long time to develop, perhaps several hundred years, primarily because combinations of local weather, elevations, aspects, productivity and disturbance agents do not provide conditions for frequent community level disturbance and change. A series of low or moderate intensity fires can change these stands to a fire climax condition. However, the more typical loss of the climatic climax condition occurs with stand replacement fires, or when the stand is converted to a pole sized condition as the larger trees die and the dense stand conditions prevent growth of replacement large trees.
>
> Conversely, fire climax forests develop with frequent light to moderate intensity ground fires. These stands are characterized by open forests dominated by large trees of early seral species (most often ponderosa pine and Douglas-fir on the mixed conifer sites on the Deschutes NF). With the absence or suppression of fires, climax species (true fir) will increase on these sites and move them towards a climatic climax condition.

SUITABLE HABITAT BY PLANT ASSOCIATION GROUP

Methods: Individual Forest plant associations groups were identified. APPENDIX I provides an updated description and discussion of these plant association groups. The major PAG groups on the Forest consist of: Mountain Hemlock, Wet Mixed Conifer, Dry Mixed Conifer, Wet Ponderosa Pine, Dry Ponderosa Pine, Wet Lodgepole Pine, and Dry Lodgepole Pine. These descriptions can be modified in individual planning areas where other groupings make more sense for clarity of analysis.

Within select PAGs, the science team felt that there were two types of late successional old growth habitats: climatic climax and fire climax. All the PAGs were considered to have climatic climax conditions with 3 PAGs also having the fire climax condition: the dry mixed conifer, wet ponderosa pine and dry ponderosa pine PAGS. These three PAGs had frequent low intensity fires that maintained the late successional old growth fire climax habitat conditions historically.

The suitable late successional old growth habitat conditions for each plant association group were based on 10 selected mammalian and avian indicator species that utilize climatic climax and fire climax habitats. These species depend on or are associated with late and old structural characteristics for primary and secondary nesting, denning, roosting and foraging. Botanical species were not used as indicators due to insufficient data on late successional old growth habitat conditions. However, in the future, using plant indicators may add a dimension that is more closely tied to soil condition and mycorrhizal habitats. We started with approximately 118 wildlife species are dependent on or are associated with climatic climax and fire climax habitat conditions. Of these, only 40 species demonstrate selection for late successional old growth structural habitat and do not utilize earlier seral stages. Then through criteria determined through research, monitoring, and evaluation of habitat characteristics that provide essential habitat components for other late successional old growth dependent or associated species, we reduced the list of 40 species to 10 species.

We then translated key habitat features into measurable habitat characteristics. Structural characteristics that describe suitable late successional old growth habitat and that can be quantified include: snags/logs, canopy cover, canopy layers, trees per acre associated with a range of structural sizes, and special features. APPENDIX II describes the 10 indicator species structural habitat characteristics by individual plant

association group. These characteristics were based on literature that best describes eastside biological habitat conditions and on Forest habitat research. Using the habitat characteristics identified for each indicator species, a suitable habitat condition table for each plant association group could be built.

TABLE I displays the suitable habitat conditions for each plant association group, using the Cultus/Sheridan LSR data as a prototype.

Results: Habitat characteristics identified for each indicator species by plant association group are displayed in TABLE I, using the Cultus/Sheridan LSR data as a prototype. It is VERY IMPORTANT to review this table carefully. This table displays a range of suitable habitat conditions. This DOES NOT mean that the low end of the range is what should be managed for. In some instances when desirable and sustainable conditions do not over lap, choosing the lower end of the range may be appropriate but it should not be used across the landscape. Landscape level considerations and site specific analysis will help make those determinations. The table will be used by each LSR Assessment team. **Site specifically, the LSR Assessment teams will need to modify the contents depending on the actual plant associations that are most common within each PAG.**

Climatic climax habitat featured numerous canopy layers, a high degree of snag and log accumulations, and high stand densities. Conversely, suitable fire climax habitat featured a range of single to multiple canopy layers, low amounts of snags and logs, and lower stand densities. In both of these late successional old growth types, the large trees component was a significant structural element. In fact, it was a critical structural element.

TABLE I: SUITABLE HABITAT CONDITIONS BY PLANT ASSOCIATION GROUP

Suitable Habitat Condition by Plant Association Group

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
MH (Climatic)	25 - 40 tons/ac. or 2700 - 4300 ft²/ac. Snags: 85% > 21" dbh (ex. 6-15/ac), 15% 15-21" dbh (ex. 2-3/ac) Logs: 100% > 31" dia. and 33' long (ex. 7-24/ac)	ave 70%	2 - 3	TPA	275	80	80	17	24	24	25	25	AM - Within PAG retain ≥ 50% of forest stand in mature/old growth for linkage, blocks of mature/old growth must be linked to provide connectivity. Tree Species: PIMO - Blister rust ABMAS - Heartrot
				BA	433	4	21	13	42	69	107	177	
Indicators: AM, BO				Stand SDI	620	10	43	23	66	101	148	≥ 187	

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
MCW (Climatic)	25 - 35 tons/ac. or 2200 - 3100 ft²/ac. Snags: 60% 9-16" dbh (ex. 9-17/ac), 20% 16-25 dbh (ex. 1-2/ac), 20% >25"dbh (ex. 1-2/ac) Logs : 60% 16-25" dia. (ex. 7-16/ac), 40% >25" dia. (ex. 3-6/ac)	> 70%	2 - 3	TPA	357	150	70	70	30	15	12	10	PWP - Roosts stands of white fir with > 4 TPA >20" live or dead. NSO - ≥ 40% of white fir understory > 8" dbh. Tree Species: PIPO and PSME - Large Tree component LOAC, TSME, TABR - Species diversity
Indicators: PWP, NSO				BA	270	7	19	55	53	14	51	71	
				Stand SDI	476	18	37	97	85	66	74	≥ 78	

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
MCD (Climatic) Indicators: PWP, GGO, NG, BE, FO, BBWP	12 - 24 tons/ac. or 1100 - 2100 ft³/ac. Snags: 70% 12-20" dbh (ex. 3-9/ac), 30% > 20" dbh (ex. .75-2/ac) Logs: 100% > 15" dia. (ex. 5-14/ac)	ave 50%	2 - 3	TPA	218	80	50	35	20	15	11	7	PWP - Roosts stands of white fir with > 4 TPA >20" live or dead. GGO - Young owlets require dense cover and/or leaning trees to escape predation. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. BE - Insure large ponderosa pine and Douglas fir trees of the super canopy provide an open flight path from tree. Maintain large trees, especially snags along riparian edges that provide panoramic views and open exposure on at least one side. BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. Tree Species: PIPO, PSME - Large tree component PILA, LAOC, CADE3, TABR, ABMAS - species diversity
				BA	218	4	13 1	27	35	43	47	49	
				Stand SDI	343	9	27	48	57	66	68	≥ 55	
MCD (Fire) Indicators: BE, WHWP, FO	Snags: BE 1-2 > 25" WHWP,FO 1-5 > 25" Logs: BE 1-2 > 25" WHWP,FO 1-5 > 25"	30-50%	≥ 1	TPA	35+	0-80 ± 50%	0-50 ± 50%	0-35 ± 50%	10 ± 50%	7 ± 50%	11	7	
				BA	144	10 total			18	20	47	49	
				Stand SDI	195+	x	x	x	28	31	68	68	

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
PPW (Climatic) Indicators: FO, WHWP	12 - 24 tons/ac. or 300 - 2200 ft²/ac. Snags: 50% 18-28" dbh (ex. .5-3/ac) 50% > 28" dbh (ex. .25-1.5/ac) Logs: 100% > 20" dia. (ex. 1-9/ac)	> 40%	≥ 1	TPA	187	40	40	40	20	17	20	10	WHWP - Old growth should be maintain at > 37% over the PAG. Tree Species: PIPO - Large tree component PICO - species diversity
				BA	285	2	11	31	35	49	86	71	
				Stand SDI	433	5	21	55	57	74	124	≥ 78	
PPW (Fire) Indicators: BE, WHWP, FO	Snags: BE 1-2 > 25" WHWP,FO 1-5 > 25" Logs: BE 1-2 > 25" WHWP,FO 1-5 > 25"	30 - 50%	≥ 1	TPA	35+	0-80 ± 50%	0-50 ± 50%	0-35 ± 50%	10 ± 50%	7 ± 50%	11	7	
				BA	144	10 total			18	20	47	49	
				Stand SDI	195+	x	x	x	28	31	68	68	

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
PPD (Climatic) Indicators: WHWP, NG	10-15 tons/ac. or 900 - 1300 ft³/ac. Snags: 15% 10-12"dbh (ex. 2.5-5/ac), 30% 12-20"dbh (ex. 1-2.5/ac), 25% 20-31"dbh (ex. .25-.75/ac) 30% > 31" dbh (ex. .25-.5/ac) Logs: 100% >20" dia. (ex. 7-15/ac)	ave 40%	≥ 1	TPA	180	40	40	40	20	15	15	10	WHWP - Old growth should be maintain at > 37% over the PAG. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. Tree Species: PIPO - Large tree component PICO - Species diversity
				BA	232	2	11	31	35	18	64	71	
				Stand SDI	394	5	21	55	57	66	93	≥ 78	
PPD (Fire) Indicators: BE, WHWP, FO	Snags: BE 1-2 > 25" WHWP,FO 1-5 > 25" Logs: BE 1-2 > 25" WHWP,FO 1-5 > 25"	30 -50%	≥ 1	TPA	35+	0-80 ± 50%	0-50 ± 50%	0-35 ± 50%	10 ± 50%	7 ± 50%			
				BA	144	10 total			18	20	47	49	
				Stand SDI	195+	x	x	x	28	31	68	68	

PAG's	Snags/Logs (Tons/Acre & Ft³/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
LPW (Climatic) Indicators: BBWP, GGO, NG	12 - 24 tons/ac. or 1000 - 2150 ft³/ac. Snags: 50% 11-20" dbh (ex. 3-8.5/ac) 50% > 20" dbh (ex. 1-3.5/ac) Logs: 50% 11-15" dia. (ex. 13-43/ac) 50% > 15" dia. (ex. 6-19/ac)	ave 60%	≥ 1	TPA	370	150	120	70	20	10			BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. GGO - Young owlets require dense cover and/or leaning trees to escape predation. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. Tree Species: PIEN PICO
				BA	158	7	32	55	35	29			
				Stand SDI	278	18	65	96	56	43			

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
LPD (Climatic) (High elevation Lodgepole pine plant associations including those adjacent to Mt. Hemlock) Indicators: BBWP	8 - 12 tons/ac. or 700 - 1000 ft³/ac. Snags: 100% ≥ 11" dbh (ex. 13-27/ac) Logs: 100% ≥ 11" dia. (ex. 34-72/ac)	ave 40%	≥ 1	TPA	360	150	170	40					BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. Tree Species: PICO ABMAS PIAL PIMO
				BA	83	7	45	31					
				Stand SDI	164	18	91	55					

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean		Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
LPD (Climatic) (Lower elevations of Lodgepole pine plant associations) Indicators: BBWP, GGO, NG	8 - 12 tons/ac. or 700- 1000 ft³/ac. Snags: 100% ≥ 11" dbh (ex. 13-27/ac) Logs: 100% ≥ 11" dia. (ex. 34-72/ac)	ave 40%	≥ 1	TPA	353	150	120	70	13				BBWP - Maintain trees with heart rot, gall rust cankers, trunk scars or mistletoe at just less than epidemic levels. Provide areas of dead or burned trees < 5 years old for foraging and roosting. GGO - Young owlets require dense cover and/or leaning trees to escape predation. NG - Maintain a diversity of large trees scattered through the stands, especially near small breaks in the canopy. Tree Species: PICO
				BA	117	7	32	55	23				
				Stand SDI	214	18	64	96	36				

PAG's	Snags/Logs (Tons/Acre & Ft²/Acre)	Canopy Cover	Canopy Layers	Total Mean	Sapling 1.0 - 4.9"	Pole 5.0 - 8.9"	Small 1 9.0 - 14.9"	Small 2 15.0 - 20.9"	Med 1 21 - 24.9"	Med 2 25 -31.9"	Large ≥ 32"	Special Features and Key Tree Species
Unique Habitats (Climatic)												
Engelmann Spruce	25 - 35 tons/ac. or 2700 - 3700 ft²/ac. **Snags:** 50% 15-20" dbh (ex. 5.5-11/ac) 50% > 20" dbh (ex. 2.5-5/ac) **Logs:** 100% ≥ 15" dia. (ex. 21-43/ac)	50 - 100%	2 - 3	TPA	275	100	70	40	25	15	15	10	**Tree Species:** PIEN PICO
				BA	277	5	19	31	44	43	64	71	
				Stand SDI	418	12	38	55	69	63	89	≥ 75	
Aspen	When regeneration is no longer occurring, manipulation would occur in a mosaic pattern throughtout stand.												
Meadows	When tree encroachment reaches a 30% loss of meadow when compared to 1959 photos, meadow restoration would occur.												
Willow Patches	When willow patches reach 80% decadence, treatment of 20% of the willows would occur. This would be random shrubs throughout the patch.												

COMPARISON OF SUITABLE HABITAT WITH SUSTAINABILITY

Methods: For our purposes, we defined on site vegetation sustainability as a condition that:

> Is not likely to experience significant negative change in habitat quality as a result of epidemic insect or disease attack or catastrophic wildfire.

Suitable habitat (both climatic climax and fire climax) was compared with on site vegetative sustainability by individual plant association group. Stand density index and fuel profile descriptions were used as quantifiers of sustainability. These factors best determine the Deschutes NF vegetative conditions and best represent the risk of bark beetle epidemics and or extreme crown fire behavior. Bark beetle attack and high intensity wildfires were chosen as indicators since these disturbance agents are the most common cause of significant and unexpected large tree mortality (large trees are a critical element of both climatic climax and fire climax types, and also take the longest time to replace). Risk to bark beetle attack was measured using stand density index stocking guides developed by Cochran et al, 1994, for the Blue Mountains, together with adjustments and equations for plant associations groups found on the Deschutes NF but not included in Cochran's guide, (Booser et al. 1996). Fuel profiles were determined using the Morehead and Vickery model, equating tons per acre/cubic feet with wildlife habitat. Then photo series for quantifying forest residues (tons per acre) and the risk of catastrophic wildfire was displayed by plant association group.

Results: We found that suitable climatic climax habitat and densities required for on site vegetative sustainability did not overlap. For example, in mixed conifer dry, suitable climatic climax habitat is almost twice the upper management zone! Therefore, some process of cycling of the suitable habitat (habitat that is not vegetatively sustainable) and sustainable stand densities across the landscape overtime needs to be developed

TABLE II, compares suitable late successional old growth habitat (climatic-climax and fire climax) conditions, with on site sustainable vegetative conditions and with existing LSR conditions by plant association groups. Suitable habitat conditions are displayed using trees per acre, the stand density index value, species composition and fuel loadings (snags and logs). These numbers are the summation of the values indicated on the suitable habitat condition table. On site sustainable vegetative conditions are defined by the Deschutes SDI values for the upper management zone (UMZ). "Sustainability" is defined by PAG and is a measure of a percent of stocking (SDI UMZ) that an individual plant association may be able to support. This SDI UMZ figure may be different than the SDI values shown in the first column for suitable habitat conditions. Remember, suitable habitat is based on species biological requirements, and sustainable forest conditions (DNF index) are based on what an individual plant association may be able to support overtime. These calculations of sustainability were intended to be a prototype since they were made using the specific vegetative conditions within the Cultus and Sheridan LSR. Existing Cultus and Sheridan LSR conditions in terms of density and fuel loading form the final column. Each LSR Assessment team will then need to adjust the range for suitable habitat based on adjustments to TABLE I and the range of sustainable forest conditions compatible with their unique mix of plant association within each PAG and the ranges in site quality of each plant association group.

It is important to note that TABLE II provides a rough comparison of suitable habitat versus sustainable forest conditions pertinent to the Cultus and Sheridan LSRs. The table does, however, represent the process we would like the LSR Assessment teams to use. **Thus, each LSR Assessment team will need to modify the columns based on individual plant associations that are most common within each PAG within their specific locations, as well as the site potential of those plant association groups.**

From these results, it appears that some process of cycling of the transient suitable habitat within the LSR overtime needs to be developed.

TABLE II: summary and comparison of conditions quantifiable between suitable habitat conditions, on site sustainable vegetative forest conditions and LSR existing conditions based on the best available data, using the Cultus/Sheridan LSR as a prototype.

PAG	SUITABLE HABITAT (1) DENSITY		FUELS	SUSTAINABLE (2) DENSITY	FUELS	EXISTING CONDITION (3)	
	TPA	SDI	TONS/AC	UMZ (SDI)	TONS/AC	SDI	TOT ACRES
MH	220-330	411-620	25-40 tons	256	< 40 tons	xxx	xxx
climatic MCW	284-430	365-581	25-35 tons	202	< 35 tons	xxx	4925
climatic MCD	175-261	279-405	12-24tons	156	<24 tons	xxx	9698
fire MCD	23-294	141-373	LOW	156	LOW	xxx	xxx
climatic PPW	150-224	347-535	12-24 tons	145	< 24 tons	xxx	487
fire PPW	23-294	141-373	LOW	145	LOW	xxx	xxx
climatic PPD	144-216	313-472	10-15 tons	102	< 15 tons	xxx	2802
fire PPD	8-273	27-216	LOW	102	LOW	xxx	xxx
LPW	296-444	222-353	12-24 tons	161	< 24 tons	xxx	1310
LPD	288-432	132-198	8-12 tons	80	< 12 tons	xxx	303
mid - low elev LPD	282-424	172-259	8-12 tons	161	< 12 tons	xxx	618

(1)Within the PAG, the plant association that was predominant within the LSRs is identified. This major plant association was used to identify which DNF indexes were used for the PAG. IF there are several major plant associations, a range of UMZ's could be used here. For subsequent site specific project analysis, the best site specific data available will be used for density prescriptions, keeping areas below the UMZ in order to sustain or create future suitable conditions, wherever possible, while still providing current, but perhaps unsustainable habitat as well, to meet current suitable late successional old growth habitat needs.

(2) Based on Cochran et al. 1994, Joanna Booser and Jim White developed the paper "Calculating Maximum Stand Density Indexes (SDI) for the Deschutes National Forest Plant Associations", 1996, that was used in determining the above table's values. Cochran advised using the lowest plant association values within the PAGs as the index. Again, the approach here was to use the UMZ of the major plant association (or major plant associations) in the PAG, which pushes management closer to the unsustainable level, but allows leaving more short term suitable habitat. The best available site specific density values will be used when managing specific stands overtime across the landscape, not the lumped PAG value used here for broadscale planning purposes.

UMZ - For most species, the upper management zone is defined as the density level at which a suppressed class of trees begins to develop (Cochran et al. 1994). This is the point at which sufficient competition is happening between trees to cause some trees to begin to slow down in growth, even to the point of death. The primary cause is that, on any given piece of ground, there are limits to the resources available for plant growth. These resources include light, water, nutrients, and growing space. When these limits are reached, loss of plant growth and/or mortality are common elements of the stand. These conditions can be ideal for certain late successional old growth plant and animal species. However, they are often providing the ideal habitat conditions only after there has been sufficient limitations of previous density levels that allowed a large tree component to develop. Historically, these limitations were provided in drier plant associations by frequent fire intervals which tended to limit development of understories and favored growth of the forest with overstory trees.

In ponderosa pine or lodgepole pine, the UMZ is calculated somewhat differently from the other species. This was recommended by Cochran et al. 1994, to show the level above which higher levels of large tree mortality are much more likely to occur. For these tree species, the UMZ correlates to a high risk threshold for markedly increased tree mortality due to many of the forest pests which are dependent on density and lower tree growth for epidemic levels to be reached. Other factors besides density, such as species composition, must be considered for the density independent forest pests such as the fir engraver beetles and spruce budworm. However, the use of UMZ in stands which are typically not hosts to density dependent pests is still recommended if the desire is to let small trees grow to large trees more quickly and safely

especially where large trees are in short supply. This is because the presence of a suppressed class of trees would indicate average tree growth in the stand is beginning to slow down, perhaps significantly.

(3) SDI and Total Acres - These numbers only relate to the Cultus/Sheridan LSR Assessment. Each site specific LSR Assessment team will need to determine their appropriate existing vegetative conditions.

CRITERIA USED TO CYCLE AND SUSTAIN DESIRED LATE SUCCESSIONAL OLD GROWTH CONDITIONS WITHIN THE LSRS

We believe that successful management of the Forest LSRs should result in the satisfaction of two criteria: 1) minimum critical thresholds should be maintained over the short term and 2) sustaining habitat above this threshold over the long term. This section reviews whether we can simultaneously satisfy both criteria at the same time.

Methods:

Critical Minimum Thresholds:

Minimum critical habitat thresholds for the northern spotted owl (climatic climax indicator species) have been set by the U.S. Fish and Wildlife Service, USDI, 1992. These thresholds were used in determining the amount and size/structure distribution of suitable late successional old growth habitat for the owl and other dependent and associated wildlife species within the LSR. The USFWS thresholds are a measure of suitable habitat within the owls home range radius. Calculations indicate that a minimum number of suitable climatic climax habitat acres for each LSR. These minimum acres are as follows: Davis LSR, 9,264 acres or 19 % of LSR; Metolius LSR, 10,422 acres or 14 % of LSR; and Cultus/ Sheridan LSR, 6948 acres, 13 % of LSR

For fire climax species, like the northern bald eagle, there are no exact numbers that can be calculated. However, there are guidelines that do provide sideboards. For example, Bald Eagle Management Areas (DNF LRMP), and the US Fish and Wildlife Service recovery plan population density criteria provide specific management direction.

Historic Range of Variability was used as a frame of reference when addressing all species viability. A pivotal assumption in the use of HRV is that an element or process that is outside the range or natural variability cannot be sustained naturally (Caraher et al. 1992). Native species have adapted to the natural disturbance events of the Holocene (the past 10,000 years) environment and require those conditions for their survival (Swanson et al. 1993). Thus, through the watershed analysis process, we developed ranges of variability for our plant association groups.

Suitable habitat was examined from a spatial standpoint. Basically we were looking at quantity of, distribution and fragmentation of that habitat on a landscape level. This element was used to adjust critical habitat threshold levels above the minimum levels set by the USFWS and levels described by HRV. This was a very important element in the decision matrix since critical habitat must also be functionally distributed.

In summary, the above 4 elements were considered in and were used to develop estimated species thresholds. For example, in the mixed conifer wet plant association group, we first factored the USFWS habitat threshold for the northern spotted owl of 40 % suitable habitat within the owl's home range radius. By LSR this varies from 13 - 19 percent of the total LSR acreage, see above. We then estimated the distribution and amount of suitable habitat, without regard to land allocation, on a landscape level. This gave a picture of how suitable habitat was distributed on the Deschutes NF and adjoining Forests. Lastly using to the Historic Range of Variability, a range from 11-43 % was in either climatic climax or fire climax habitats. Thus, when these elements were factored together, along with an additional factor of how little the mixed conifer wet PAG made up of the LSR, we determined the percentage for the suitable habitat threshold.

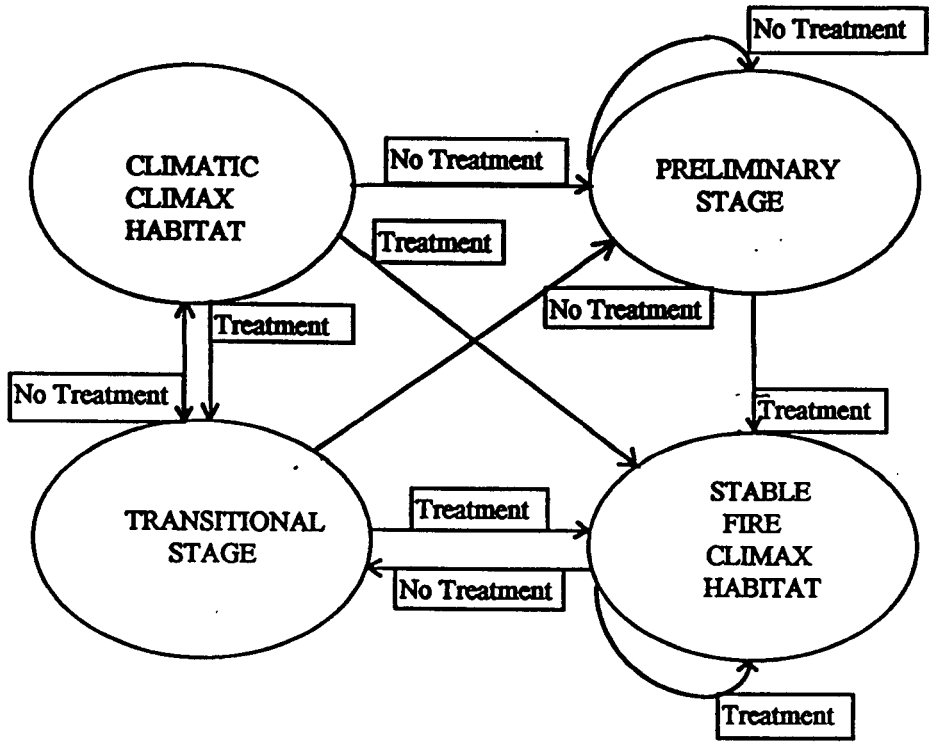
Cycling Suitable Habitat:

In order estimate how much suitable habitat could be consistently sustained in the LSR overtime, we used two approaches. First we developed a conceptual flow model to visualize how we might approach cycling of late successional old growth habitat across the landscape, FIGURE I. In this model landscape vegetation was divided into four stages: 1) preliminary vegetation stage; 2) stable fire climax suitable habitat stage; 3)

transition vegetation stage; and 4) climatic climax suitable habitat stage. Movement between the 4 vegetation stages, as a result of no management versus management (thinning to below the upper management zone) was also theorized. Rates of flow between the 4 vegetation stages were assumed based on general forest growth relationships and general forest pest behavior and impacts specific to central Oregon.

Second, we used the Historic Range of Variability to visualize how natural processes cycled the vegetation. The HRV numbers were taken from the watershed analysis for Odell and Metolius WA.

FIGURE I. Conceptual Flow Model of cycling suitable habitat in response to treatment (1) or no treatment.



(1) Treatment consists of stocking control measures that result in on site stability and this promotes the growth and retention of large tree dominated forests.

The 4 vegetation stages are described in detail as follows:

Preliminary vegetation: Stands falling into this group, do not satisfy the requirements of either climatic climax or fire climax dependent or associated species. These stands encompass a wide range of structures and densities but share the common characteristic that large trees are not prevalent.

Management of these stands should emphasized growth into the late successional old growth condition as quickly as possible. Management activities in high risk stands could move them towards this group by thinning to lower susceptibility to bark beetles so existing trees can rapidly continue their development towards large trees. It may also take the form of a prescribe burn to remove hazardous levels of fuels. In the frequent fire adapted ecosystems, lack of management will result in

cycling from other categories back to this category for many stands as a result of insect and disease attack and catastrophic wildfire.

Stable fire climax suitable habitat: Stands falling into this group of vegetation satisfy the requirements for suitable fire climax habitat and they are below the upper management zones. Without density management, or the re-introduction of fire, these stand types often progress into the unstable fire climax stage described below and may progress into unstable climatic climax suitable habitat. Continued density reduction through mechanical thinning or thinning by prescribed fire will maintain stands in this category.

Transitional vegetation: The condition that exists when stable fire climax vegetation transitions increases in density and becomes unstable fire climax but not yet suitable climatic climax. This condition is above the upper management zone but below the density levels or large tree sizes required to achieve the necessary structural attributes for climatic climax suitable habitat. Management in these stands should focus on developing the large tree component for climatic climax, developing the understory conditions needed for climatic climax when the large tree structure is already present, or density reduction to return the stand to suitable fire climax conditions.

Climatic climax suitable habitat: This group has the structural attributes necessary for climatic climax late successional old growth habitat, i.e. nesting, roosting and foraging habitat for the northern spotted owl. In most situations, this habitat cannot be managed both to retain these essential characteristics and be below the upper management zone. In some cases, however, it could be thinned, prior to some natural endemic advent, to a fire climax late successional old growth condition which is stable and could, in a relatively short period of time once again be suitable climatic climax. This action might be appropriate if there are disproportionately large amounts of climatic climax and small amounts of fire climax. Without treatment this vegetation group will revert to some variation of the preliminary vegetation stage or less likely to transitional vegetation.

Under active management and no management scenarios, it is very likely that the stand would not remain over time as climatic climax habitat. The difference would be that under active management the desired large tree structure could likely be retained over time; under no management it would likely not be retained.

Using one to several rotation cycles for each plant association group, we cycled structural stages through time, so there will be habitat on line to replace existing habitat when it no longer functions. Estimated growth, the use of the upper management zone (UMZ) to help determine levels of sustainability, and mortality rates were used to help determine realistic cycles. Suitable habitat decline will most likely be as a result of insect, and/or disease attack or wildfire.

TABLE III represents a visual display of the criteria, giving a quantitative representation to these criteria and size structure groups using percentages or a range of percentages.. Because the landscape was so fragmented and the amount of remaining suitable habitat was only found within the LSR, we found that spatial considerations were very important when determining suitable habitat thresholds. Concerns about the spatial distribution of habitat resulted in higher levels of habitat compared to the USFWS thresholds and historic levels. These concerns only applied to the mixed conifer plant association groups.

TABLE III EVALUATION CRITERIA, FOREST WIDE.

SIZE STRUCTURE	SUIT HAB. THRESHOLDS. .% of Acres in ea size class				CYCLING (1) % of Acres in ea size class				HRV % of Acres in ea size class				
	MCW	MCD	PPW/D	LPPW/D	MCW	MCD	PPW/D	LPPW/D	MCW	MCD	PPW/D	LPPW/D	HM
SEED/SAP (2) 0-5"	-	*	*	25	6	7	5	25	0-40 0-25	0-40*	5-50	0-80 0-60	0-3
POLE (2) 5-9"	-	*	*	25	7	7	5	25	3-30* 23-80*	*	28-100*	10-80	0-40
SMALL (2) 9-21"	40	30*	40*	50	12	15	10	50	0-32 *	32-100* *	* 2-50	10-100 10-60	0-50
MEDIUM (3) 21-32"	60*	60c/10f*	5c/55f*	-	25	38	20	-	11-43*	23-90*	20-70*	0+	5-20*
LATE/OLD (3) >32"	*	*	*	-	50	33	60	-	*	*	*	-	*

(1) Different rotation lengths were used for each plant association group. These rotation lengths (untill regeneration is required) are as follows: MH, 600-1200 + years; MCW, 400 years; MCD 350 years; PPW/D, 500 years and LPPW/D, 100 years. The number of years within each structural group maybe calculated by multiplying the percent (as a decimal) in the table by the rotation length.

(2) These two size/structure classes represent the preliminary stage.

(3) These size/structure class represents either the stable fire climax habitat stage, transitional stage or the climatic climax habitat stage.

* - Percentage is shared between size structure classes, either up or down the size scale.
c - Climatic climax.
f - Fire climax.

Within the HRV column, note 2 sets of numbers. These represent figures from the Cascade Lakes and Odell Watershed Analysis.

Results: TABLE IV represents the integration of the above criteria to achieve a proposed distribution of vegetative conditions by plant association group across the landscape. Vegetation conditions are divided into 4 groups: 1) Preliminary vegetative conditions that are not large tree dominated. It recommended that these preliminary stage stands be managed below the upper management zone to hasten the development of large; 2) Suitable habitat – fire climax; 3) Vegetative conditions that are above the upper management zone but are less than suitable habitat and is transitional stage in Figure I; and 4) Suitable habitat– climatic climax. We propose that if the four conditions are well distributed in the displayed proportions across the LSR, that with management, a continual supply of suitable habitat can be maintained over the long term.

These percentages, since they are derived from integration of the species and tree growth data specific to each LSR, will vary somewhat based on the plant associations that make up the majority of each PAG, and the wildlife species that use these habitats.

TABLE IV: DESIRED AMOUNTS OF 4 TYPES OF VEGETATIVE CONDITIONS

PAG (1)	PRELIMINARY STAGE (2)	SUITABLE HABITAT % FIRE (3)	TRANSITIONAL STAGE (4)	SUITABLE HABITAT % CLIMATIC (5)
MH	15 (0-30)	NA	15 (0-30)	70 (40-70)
MCW	30 (20-40)	NA	10 (0-20)	60 (50-70)
MCD	25 (20-30)	10 (5-10)	25 (20-30)	40 (30-50)
PPW/D	20 (10-30)	55 (40-70)	20 (10-30)	5 (0-10)
PPW/D FORESTED LAVAS	20 (10-30)	5 (0-10)	20 (10-30)	55 (40-70)
LPW/D	40 (20-60)	NA	10 (0-20)	50 (30-70)

DESCRIPTION OF THE COLUMNS

(1) Plant Association Groups are the combinations of plant associations, described by Volland, 1988, grouped according to productivity and growth potential. All plant association groups are the groupings defined by the science team meeting of February 22, 1996. Those groupings match the groupings in the WEAVE document with a few changes/exception as noted in the notes from the February 22 meeting. It should be noted that while PAGs work well as guidelines for landscape analysis, specific plant associations or individual stand measurements where available, must be used for site specific prescriptions to best meet long term habitat objectives

(2) vegetative conditions that are below the upper management zone, thus, sustainable. See figure I, this column relates to the preliminary stage. UMZ defines the point at which a suppressed class of trees begins to develop or high risk threshold of density related insect - indexed mortality for large pines is reached. In other words, the stand can maximize growth with little or no threat from insect attack. When prescribing management in these stands, consideration should be given to the conifer species and diameter mix desired to move these stands towards late successional old growth suitable habitat conditions.

(3) Suitable habitat – fire climax conditions - as quantitatively described in TABLE I. See figure I, this column relates to the stable fire climax habitat stage.

(4) vegetative conditions that are above the upper management zone but are less than suitable habitat, describes a range of conditions between these two quantitative points. See figure I, this column relates to the transitional stage.

(5) Suitable habitat – climatic climax conditions - as quantitatively described in TABLE I. See figure I, this column relates to the climatic climax stage.

It is important for readers to understand that the objective of all management within the LSRs, is to provide suitable late successional old growth habitat for the long term. Stands in column 5 (less than the UMZ) must be managed to provide big trees of long-lived species like ponderosa pine and Douglas fir in a short period of time. Wise management of these stands will set the stage for moving into column 4 (above the UMZ) where these stands should meet the large tree criteria of suitable habitat. Stands in column 4 should continue to be managed to encourage development of large tree structure to replace loss of habitat in column 1 over time.

The mixed conifer dry PAG generated the most discussion and discomfort with relative percentages generated for columns 2-4, both in terms of suitability and sustainability.

> The minimum critical thresholds of suitable habitat were the base starting point in building the desired condition table for late successional old growth habitat conditions. **It is very important to note that the LSR should not be managed for the minimums but rather as optimal habitat for late successional old growth habitats for those dependent or associated species.**
>
> Estimated time frames for how long those late successional old growth conditions might last and how long it would take to grow those conditions back from a regenerated stand were considered for various structural stages and the length of time in each of those stages.
>
> > In mixed conifer dry, it was estimated that it would take 250 to 350 years to grow late successional old growth conditions from a regenerated stand (if managed).
> >
> > Depending upon the plant association group, it was estimated that the suitable habitat conditions would last in the mixed conifer wet PAGs approximately 60 years and within the mixed conifer dry PAGs approximately 30 years.
> >
> > It was also determined that on a 300 year rotation, you could only have 1/6 (about 17%) of the land area in suitable habitat on a sustainable basis.
>
> With management, stands in the mixed conifer PAGs could have the species mix kept to a fairly resistant mix for defoliators, and could allow manageable losses of bark-beetle susceptible trees. This might then let us get up to 40% of the PAG in a fairly sustainable suitable habitat connotation, with replacement stands coming along in the appropriate structural conditions.

SUMMARY

Several important conclusions may be drawn as a result of this paper. First, in order to effectively manage our LSRs, we must be able to define what the late successional old growth suitable habitat conditions are for both climatic climax and fire climax forests. The definition must make ecological sense, and must be measurable and practical on the ground. TABLE I provides the framework to fully describe suitable habitat conditions for the plant association groups on the Deschutes NF, based on the characteristics of the major plant associations within those groups. Each LSR Assessment team will need to adjust the contents of TABLE I to fit the actual plant associations that are most common within their LSR, for each plant association group.

Second, most of our suitable climatic climax habitat conditions within our LSRs are often not sustainable for any period of time. Meeting suitable climatic climax habitat conditions for late successional old growth species and keeping the stands below the upper management zone are not compatible as clearly displayed in TABLE II.

Lastly, a strategy of rotating late successional old growth habitat through several vegetative structural stages and across the landscape through management seems to be appropriate. It also appears doable using the USFWS minimum thresholds and historic range of variability. However, it may not be achievable at this time due to quantity of -, distribution and fragmentation of the suitable mixed conifer late successional old growth habitats on a landscape level that currently exists within our LSRs. An aerial view of our landscape shows that almost all of our late successional old growth habitat is within our LSRs. Even inside our LSRs, the landscape is heavily fragmented. The balance of the landscape is also heavily fragmented with few residual stands of late successional old growth habitat.

Most of the plant association groups on the Forest and in general, eastside forests, are not able to provide large sustainable contiguous blocks of suitable northern spotted owl habitat, i.e. climatic climax habitat. Historically, on the Deschutes NF it is believed that owl habitat was limited to the wet mixed conifer and moist north aspect dry mixed conifer PAGs. The pattern of this habitat was in a mosaic distribution, intermixed with earlier seral stages. Currently, the Deschutes NF has 34 owl pairs utilizing fragmented habitat, of which only a few are reproductively successful on an annual basis. Fragmentation of the historic areas, due to past timber harvest, and the exclusion of fire have provided opportunity for the owls to shift use to other available habitats, like dry mixed conifer stands outside the north aspects. This habitat is also available for other species that are dependent on or are associated with these climatic climax vegetative conditions. Many of these conifer stands are currently experiencing heavy mortality due to high stocking densities and conifer species shifts resulting from changes in the fire cycles and past timber harvest.

In summary, we realize that the desired condition for the mixed conifer PAGs is higher than what could be naturally sustainable. This desired condition is really a reflection of our current landscape patterns and quantity of suitable habitat. We recognized this lack of stability and tried to achieve a balance as possible given the above constraints.

Appendix I -- Plant Association Groups and Data Sources for Vegetative Information

Plant Association Groups	Plant	Associations	Eco-class	Prod Class
Meadows	* MW	Wet Meadow	MW	7
	* MM	Moist (Hairgrass) Meadow	MM	7
	* MM	Moist (Bluegrass) Meadow	MM	7
	MD	Dry Meadow	MD	7
Xeric Shrublands	SD	Low sagebrush/Idaho fescue	S1	7
	SD	Big sagebrush/bunchgrass	S1	7
	SD	Big sagebrush/needlegrass	S1	7
	SD	Big sagebrush-bitterbrush/bunchgrass	S1	7
	SD	Buckwheat Flats	BF	7
	GB	Bluegrass Scabland	G1	7
Mesic/Wet Shrublands	* SW22	Associations within forest zone or one topographic positions such as flood plains and canyons which accumulate subsurface moisture. Stands have either alder, willow, or spirea as dominant woody vegetation; could be forest lands if fire has been suppressed.	SW	
	* SW11	Associations within riparian areas with standing or running water. Soils imperfectly drained through much of the growing season. Shrubs commonly alder, willows huckleberries or spirea.	SW	
Alpine Shrublands	SS15-11	High elevation; above timberline; soils imperfectly drained early in the growing season or well drained.		
Subalpine/Alpine Meadows	MS21	Associations dominated by sedges and occurring at high elevations; soils imperfectly drained-moist into summer		
Juniper Woodlands	CJ-S3-11	Juniper/bitterbrush/bunchgrass	J1	7
Ponderosa Dry	CP-S1-12	Ponderosa pine/bitterbrush-big sage/squirrel tail	PS	7
	CP-S2-17	Ponderosa pine/bitterbrush-manzanita/fescue	P3	6
	CP-S2-12	Ponderosa pine/bitterbrush/needlegrass	P5	6
	CP-S2-15	Ponderosa pine/bitterbrush/sedge	P1	6
	CP-S2-18	Ponderosa pine/bitterbrush/squirrel tail	PN	6
	CP-S3-12	Ponderosa pine/bitterbrush-snowbrush/sedge	P4	6
	CP-S2-13	Ponderosa pine/bitterbrush-manzanita/needlegrass	P2	6
	CP-S2-16	Ponderosa pine/bitterbrush/bluebunch wheatgrass	P8	6
	CP-S1-11	Ponderosa pine/bitterbrush-big sage/fescue	P8	6
	CP-S2-14	Ponderosa pine/bitterbrush-manzanita/sedge		6

Plant Association Groups	Plant Associations		Eco-class	Prod C
Ponderosa Wet	CP-S2-11	Ponderosa pine/bitterbrush/fescue	P1	6
	CP-S3-14	Ponderosa pine/bitterbrush-snowbrush/fescue	P3	6
	CP-S3-11	Ponderosa pine/bitterbrush-snowbrush/needlegrass	P7	6
	CP-G2-12	Ponderosa pine/sedge-fescue-peavine	PF	4
Lodgepole Dry	CL-G3-11	Lodgepole pine/needlegrass basins	L6	7
	CL-G4-13	Lodgepole pine/sedge-needlegrass basins	L6	7
	CL-S2-14	Lodgepole pine/bitterbrush/fescue	L3	6
	CL-S9-11	Lodgepole pine snowbrush-manzanita	P2	6
	CL-G3-14	Lodgepole pine/needlegrass-lupine	L7	6
	CL-S2-12	Lodgepole pine/bitterbrush/sedge	L4	5
	CL-S2-15	Lodgepole pine/gooseberry-bitterbrush/needlegrass	L5	6
	CL-S2-11	Lodgepole pine/bitterbrush/needlegrass	L5	6
	CL-S2-16	Lodgepole pine/bitterbrush (rhyolite)	L9	6
	CL-S1-12	Lodgepole pine/big sage (rhyolite)	L0	6
	CL-S1-11	Lodgepole pine/big sage/fescue	L	
Lodgepole High Elevation	CL-G3-13	Lodgepole pine/needlegrass-lupine-linanthastrum	L7	6
	CL-S4-12	Lodgepole pine/grouse huckleberry	L8	5
	CL-S3-11	Lodgepole pine/pinemat manzanita	L6	7
Lodgepole Moist/Wet	CL-M4-11	Lodgepole pine/beargrass	M2	5
	CL-G4-12	Lodgepole pine/sedge-penstemon-lupine	M1	5
	CL-G4-11	Lodgepole pine/sedge-lupine	L8	
	CL-M2-11	Lodgepole pine/bearberry	L2	
	CL-S2-13	Lodgepole pine/bitterbrush/forb	L2	6
	CL-M1-11	Lodgepole pine/sedge-grass wetland	L1	5
	* CL-M1-12	Lodgepole pine/kentucky bluegrass		
	* CL-M1-13	Lodgepole pine/widefruit sedge		
	* CL-M1-15	Lodgepole pine/tufted hairgrass		
	* CL-M3-11	Lodgepole pine/grouse huckleberry/forb wetland	L1	5
	* CL-M3-12	Lodgepole pine/bog blueberry/widefruit sedge		
	* CL-M3-13	Lodgepole pine/Douglas spirea/forb		
	* CL-M3-14	Lodgepole pine/Douglas spirea/widefruit sedge		
	* CL-M9-11	Lodgepole pine-Engleman spruce/few flowered spikerush		
Mixed Conifer Dry	CW-H1-11	CW/snowbrush-chinkapin	W2	6
	CW-S1-14	CW/snowbrush	W1	5
	CW-S1-12	CW/snowbrush-manzanita	W1	5
	CW-C2-11	CW/snowbrush-chinkapin/bracken fern	W3	5
	CW-C2-13	CW/snowbrush/sedge-bracken fern	W5	5
	CW-S1-15	CW/snowbrush/sedge	W6	5
Mixed Conifer Wet	CW-C2-12	CW/snowbrush-chinkapin/pinegrass	W3	5
	CW-S1-13	CW/manzanita-snowbrush/sedge-penstemon	W0	4
	CD-S6-13	CW/snowberryforb	W8	3
	CD-S6-12	CW/snowberry/twinflower flatlands	W9	4

Plant Association Groups	Plant	Associations	Eco-class	Prod. Class
	CD-S6-14	CW/snowberry/elk sedge	W7	4
	* CW-S9-11	Englemann spruce bottom lands	E1	4
	* CW-F4-31	White fir/queencup beadlily		
	* CW-M2-22	Engleman spruce/queencup beadlily		
	* CE-M3-11	Engleman spruce/bog blueberry/forb		
	* CE-M3-12	Engleman spruce/bog blueberry/widefruit sedge		
	* CE-M1-11	Engleman spruce/widefruit sedge		
	* CE-M2-21	Engleman spruce/common horsetail-twisted stalk		
Mountain Hemlock +	CM-S1-11	Mt. hemlock/grouse huckleberry	M1	5
Whitebark pine		Zones above Mt. Hemlock		
Riparian	HQ-S2-21	Quaking aspen/common snowberry/blue wildrye		
	HQ-M1-21	Quaking aspen/blue wildrye		
	HQ-M4-11	Quaking aspen-lodgepole pine/Douglas spirea/widefruit		

* Plant associations marked with * can be found adjacent to streams and can be included in the riparian plant association group for mapping ecological units.

DATA SOURCES FOR VEGETATIVE INFORMATION

a. Data Sources for Potential Natural Vegetation (Plant Association Groups)

1. Timber stand exam field verified plant associations
2. 1976 Soil Resource Inventory Ecoclass Map, 2"/mi. USGS Topographic Maps
3. Vegetation Resource Survey (Forest Timber Type Mapping from 1982)
   - Photo typing was completed on 1981 resource photos
   - TRI/GIS Database includes stratification codes on ecotype codes which correspond to the 4"/mi. GIS stand maps.
   - SO Timber Inventory has original 4"/mi, Orthophoto Stand Maps
4. Aerial Photo Interpretation
5. Ecology Plots, Inventory Plots, Managed Stand Survey Plots
6. Forest Ecomapping Contract (Available at the end of 1995)
7. Local Knowledge
8. 1908/1916 Timber Type Map located in 1908/1916 Fire Records.

b. Data Sources for Current Vegetation

1. Timber stand exam information -- Stand data base
2. PMR
3. Aerial Photo Interpretation (complete set of 1989 infra-red available).
4. Activity data and mapping since 1988 to update PMR
   - Stand database and IADB
   - Harvest Layer
   - Reforestation Layer
   - Timber Stand Improvement Layer
   - Fuels Layer
5. Fires since 1988 to update PMR
6. Forest Decline Layer

c. Data Sources for Historical Vegetation Patterns

1. Forest Ecologist, Bill Hopkins
2. Forest Fire Atlas Maps which date back to the early 1900's
3. Cadastral survey notes which date mid to late 1800's
4. Historic literature
5. Forest fire lookout panoramic photos taken in the 1930's
6. 1943 and 1959 aerial photos
7. Stand reconstruction field data
8. Fire History studies and analysis (see Appendix E)

APPENDIX II: HABITAT STRUCTURE CHARACTERISTICS FOR THE 10 INDICATOR SPECIES.

Habitat Structure Characteristics Summary Sheet

Species	PAG's	Snags	Logs	Canopy Cover	Canopy Layers	Tree Size/ Trees per Acre	Basal Area	Home Range	Special Features
American Marten (AM)	MH	*18 >31" 13' tall (E), *class 2 & 3 (G) * 20-35/ac (H) *>20" at rest sites >31" at den sites (C)	*8-20/ac (H) * > 31" and 33' (E) 16/acre *>20" at rest sites >31" at den sites Intermediate decay class (C)	*40-60% at rest and forage sites Avoids stands <30% (F) *71% ave 83% (G)	*2-3	*Rest Sites >20"dbh - 50% *>39"dbh- 50% (C) *20-30" dbh (G) Den Sites *>31" dbh (C) *31-49" dbh (I)	*131-262 ft²/ac (D), *126-252 ft²/ac (I) *167-192 ft²/ac (G)	Female *3.9 mi² (C), *1.8-9.6 mi² (D), *1 mi² (H) Male * 6.7 mi² (C), *4.4-21.2 mi² (D), *2-4 mi² (H) *1-2 mi² (I)	*w/in 1-5 mi² retain ≥50% of forest stand in mature/OG for linkage, blocks of mature/OG must be linked to provide connectivity (H) *Needs at least 160 acre blocks of suitable habitat (E)
Boreal owl (BO)	MH	*2-3 > 15" 1-7/acre >15" at nest sites 2.4/acre >15" at roost sites (J)		*30-63% *Roosting- Winter-58% Summer-63% 44% average at roost sites 26-34% at nest sites (J)	*2-3	Nest Sites *23 (± 6) TPA >15" 1-9" (161± 66 TPA)) *Roosts: Winter 656 TPA 1-9":67 TPA >9" Summer 1060 TPA 1-9" 84 TPA >9" Combined 6 tps >15" (J)	*78 (± 14) ft²/ac Roosting- Winter 113 ft²/ac Summer 130ft²/ac (J)	Winter *5.6 mi², Summer 4.5 mi² (J)	
Pileated Woodpecker (PWP)	MCW & MCD	* ≥3/ac >20" (K) *Forage >12" (I)	*Recommended 40/ac ≥ 15" (K) *Mean density 117/acre ≥ 15"	* ≥ 60% (K)	*2-3	*28", roosts (L) *>8" >20", roost >9", foraging >21", nest tree (I)		*1.6 mi²(K) *543 acres/pair (I)	*Roost stands of Grand fir >4/ac > 20" live & dead (L)

Species	PAG's	Snags	Logs	Canopy Cover	Canopy Layers	Tree Size/ Trees per Acre	Basal Area	Home Range	Special Features
Northern Spotted Owl (NSO)	MCW	*8/ac ≥ 16" (M) * >5/ac (>25") >6/ac (16-25") 16 >25") (N) *>16/ac (9-16") 12/ac >15" (O)	*15/ac ≥ 10" (M) * >8/ac (16-25") >5/ac (>25") (N) *15/ac >15" (O)	*60-65% (M) *70-100% 63-67% (N) *75% (O)	*2-3	*OS - ≥ 8 TPA ≥ 21" 2L - ≥ 82 TPA ≤ 21" (M) *70-90 tpa (5-9") 50-70 (9-16") 20-30 (16-25") 12-19 (>25") (N) * OS -22 TPA ≥25" 2L - 280 TPA (O)	*180-210 ft²/acre (Range 135-350) (N)		*>40% white fir understory > 8", Patch size, 40-200 acres of suitable habitat (M)
Bald Eagle (BE)	MCD			*OS <20% (Range 20-40%) 2L-20-40% Overall - 20-40% (<70%) (R)	*1-2 (R)	*OS- 8.5 TPA >44"(Range 1-30 TPA) 2L - 40 TPA 20" (R)		*10-15 mi² Distance between occupied nests .6-2 miles (Q)	*Nest tree has open flight path and panoramic view, Perching w/in 165' of H2O, typically in snags, tallest tree along shoreline w/panoramic view & open exposure on at least one side (Q)
Flammulated Owl (FO)	PPW MCD	* > 28" dbh (S) * 22 ± 4.7", 28 ± 5.7" 11.8 - 22.8, nests in snags(J)		* <50% (T) *35-70% (J)	* >1 Roosts >2 (J)	*28" dbh, nest trees 134 ± 59 TPA, 238 ± 182 TPA Roosts - 800 TPA (J) >19.6" dbh (S) *7.8-19.6" surrounding stand (T)	*103 ± 84.6 ft²/ac Roosts - 562 ft²/ac (J)	Male * 25 acres (I)	*Roost- select PP w/in MC stands, avoids pure PP (J)

Species	PAG's	Snags	Logs	Canopy Cover	Canopy Layers	Tree Size/ Trees per Acre	Basal Area	Home Range	Special Features
White-headed Woodpecker (WHWP)	PPW PPD	Nests * >31" (V) * > 18" (Range 9-39), nests(I) *1 snag/ac, 26" nests, (W) Roosts * >24" (V) *45/100 ac 10", 82/100 ac 12", 45/100 ac 20" (X) *Decay Class 2-4 (V)		* Nest < 26% (W) * 24%(mean) Roosts, 44% (V)	* > 1 (W)	*Nest Areas ≤166 TPA (X) * Foraging > 20" (I) *10 TPA > 21" or 2 TPA > 31" >24" dbh, forage nest av. 26" ,range, 8-31" (W) *Mean 31" dbh, nest 24" dbh, roost 29" dbh, forage (V)	* ≥ 40 ft²/ac lg trees Nest sites, 15-22 ft²/acre (V)	*.8-1.3 mi² In contiguous stands, 524 acres (V) *1.7 mi² (0.18-3mi²) 261 acres in pur OG stands (W)	* home ranges should contain > 37% OG (V) * Forages in live trees, secondarily use snags (W)
Black-backed Woodpecker (BBWP)	LPW LPD MCD	* >11" dbh (I) *>60% mpp (Y)		* Nest - mean in uncut stands, 24% Roost - mean >40% (Y,Z)		*Mean 11" dbh of nest trees; Mean 8" stem size at nest sites (Y,Z) Mean 14.6", nest (Y) *Mean forage stands, 10"; all trees used for foraging, 15"; lpp used for foraging, 14"; roost trees, 11" > 4" -503 TPA,(Z)	*Mean roost sites, 115 ft²/acre Forage Sites -mixed conifer, 363 ft²/acre; mixed conifer dominated by lpp, 413 ft²/acre; lpp, 411 ft²/acre; Nest sites -lpp, 79-112 ft²/acre; mixed conifer dominated by lpp, 136 ft²/acre (AD)	*1.5 mi² 956 acre/pair (Y) *Mean 430 acres (I)	*Roosts in gall rust cankers, trunk scars, or mistletoe (I), Nests in snags dead < 5 years, Heart rot critical key factor in nest selection (Y)

Species	PAG's	Snags	Logs	Canopy Cover	Canopy Layers	Tree Size/ Trees per Acre	Basal Area	Home Range	Special Features
Great Gray Owl (GGO)	LPW LPD MCD		* >8" dia.w/in forage sites (AC)	*Foraging - 11-50% (I) *Nesting > 60% (range 52-99%) (J) *11-59%, males at forage & roost sites (AC, J) *Juveniles, 50%, ≥60% (AC)		*Mean dbh of stick nests, 23" Mean dbh of broken top nests, 31" (I,AC) *Perch and forage trees, 10" (AC)		Adults *11.6 mi² (J) *30 mi² (I), *26 mi² (AB) Juvenile *60 mi² (I) *61 mi² (AB)	*Owlets need dense cover or leaning trees (I) Openings *Nests w/in 0.2 mi of opening (I) * Size range15-247 ac (AA) *Plant height averages 8", grass dominated (AC)

Species	PAG's	Snags	Logs	Canopy Cover	Canopy Layers	Tree Size/ Trees per Acre	Basal Area	Home Range	Special Features
Northern Goshawk (NG)	LPW LPD MCD	*25-75/acre, 8-10", pine forest type 5-15/acre, 7-12", pine/fir forest type 5-70/acre, 6-20", fir forest type (U)	*50-85/acre, 9-10", pine forest type 65-70/acre, 9-11", pine/fir forest type 40-190/acre, 5-9", fir forest type (U)	Nesting *44-85% (AD) *>40% (AF) *79%, good (AG) *≥70% Recommend >90% (AE) *49-74%, pine forest type 71-91%, pine/fir forest type 70-94%, fir forest type (U)	* > 1 (AK, AL)	*Nest Stands Mean dbh,11" 526 TPA (AD) *Nest Area Mean nest tree dbh 12.4 (7-20") Mean nest tree, 29" Mean nest area, 13" 53.8 tpa (AD) *Ave dbh on the east side, 14" (AE) *Ave. stand size, 17" (AF) *MC, >25/acre >20", good nesting habitat (AG) *2.5-4.9", 86tpa 4.9-8.9", 225 tpa 8.9-15.9", 192 tpa >15.9", 7 tpa (AD) *Nest dbh pine forest type, 20-33"; pine/fir forest type 28-39"; fir forest type, 19-39" TPA pine forest type >11", 30-40; >20", 10-25; TPA pine/fir forest type >11" 45-110, >20", 20-25; TPA fir forest type >11" 35-110, >20", 20-45	*217 (range 148-283) ft²/ac 221 ft²/acre in nest areas (AD) *30-92 ft²/ac, live trees (AF) *152-179 ft²/acre, live & dead, pine forest type 116-181 ft²/acre, l &d, pine/fir forest type 143-262 ft²/acre, l&d, fir forest type Pine forest type, 1-4.9", 20-25; 5-8.9", 95-160; 9-14.9", 15-20; 15-20.9", 0-10; 21-24.9", 10-20; 25-31.9", 5-10; 32"+, 0-10 Pine/fir forest type, 1-4.9", 25-35; 5-8.9", 30-95; 9-14.9", 55-105; 15-20.9", 10-35; 21-24.9", 0-10; 25-31.9", 5-10; 32"+, 0-15 Fir forest type 1-4.9", 5-45; 5-8.9", 25-70; 9-14.9", 5-115; 15-20.9", 5-40; 21-24.9", 5-20; 25-31.9", 5-25; 32"+, 0-10(U)	*6-15 mi² (AE, AF) *0.8 mi² if there is a lot of suitable habitat (AE)	*Nest tree is usually the largerst w/in the stand and near small breaks in canopy (I) *Fully suitable stands contain 2 alternate nest stands within 0.6 miles of each other >20 acres (AG)

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MEMORANDUM

DATE: August 8, 1996

TO: Robert W. Williams, Regional Forester, Forest Service, Region 6

FROM: Donald R. Knowles, Executive Director Don Knowles

SUBJECT: Regional Ecosystem Office Review of the Davis and Metolius Late-Successional Reserve Assessments, Deschutes National Forest

Summary
The Regional Ecosystem Office (REO) and the interagency Late-Successional Reserve (LSR) Work Group have reviewed the Davis and Metolius LSR Assessments (LSRA). The REO finds that the Davis and Metolius LSRAs provide a sufficient framework and context for future projects and activities within their respective LSRs. Future silvicultural and salvage activities described in these LSRAs that meet both the criteria and objectives of the respective LSRAs and the Standards and Guidelines (S&Gs) in the Northwest Forest Plan (NFP) are exempted from subsequent project-level REO review.

Basis for the Review
Under the S&Gs for the NFP a management assessment should be prepared for each large LSR (or group of smaller LSRs) before habitat manipulation activities are designed and implemented. As stated in the S&Gs, these assessments are subject to REO review. The REO review focuses on the following:

1. The review considers whether the assessment contains sufficient information and analysis to provide a framework and context for making future decisions on projects and activities. The eight specific subject areas that an assessment should generally include are found in the NFP S&Gs (page C-11). The REO may find that the assessment contains sufficient information or may identify topics or areas for which additional information, detail, or clarity is needed. The findings of the review are provided to the agency or agencies submitting the assessment.

2. The review considers potential treatment criteria and treatment areas addressed in the LSRA. When treatment criteria are clearly described in the LSRA—their relationship to achieving desired late-successional conditions are also clear—subsequent projects and activities within the LSR(s) may be exempted from REO review, provided they are consistent with the LSRA criteria and NFP S&Gs. REO authority for developing criteria to exempt these actions is found in the S&Gs (pages C-12, C-13, and C-18).

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Scope of the Assessment and Description of the Assessment Area

Davis—The LSRA addresses the 48,890-acre Davis LSR (#0-57), located east of the Oregon Cascade Crest on the Crescent Ranger District, Deschutes National Forest. Much of the Davis LSR is occupied by dry mixed conifer forest that is characterized as a "fire climax" ecosystem. Many of these forest stands are heavily stocked and at high risk for insect and disease infestation and catastrophic fire.

Metolius—The LSRA considers the 75,762 acre Metolius LSR (#0-51), located in the Deschutes Province on the Sisters Ranger District, Deschutes National Forest. Roughly 2/3 of the Metolius LSR is occupied by a mixed conifer plant group, with almost 1/3 occupied by the ponderosa pine plant group. Minor components of mountain hemlock and lodgepole pine occur. The LSRA identifies 4 major vegetation trends: (1) greatly increased stand densities, (2) increasing mortality of larger trees and insect and disease damage, (3) species composition shifting from early to late seral species, and (4) stand structure shifting from larger to smaller trees and from single or double canopy layers to multi-canopy layers. Given these trends, and considering that almost 2/3 of the ponderosa pine and mixed conifer plant groups are considered a dry type, there is concern over the occurrence of large-scale stand replacing events.

Review of the Assessments

Documents submitted for review of the Davis LSRA included the LSRA, fire plan, two "white papers" (included as appendices) entitled "Definition and Procedures for Classifying Stands as Imminently Susceptible to Insect Attack and Wildfire" and "Desired Late-Successional Reserve Condition," and appendices. Documents submitted for review of the Metolius LSRA included the LSRA (June 25, 1996 version) and its attached appendices "Vegetation," "Desired Condition for Late-Successional Habitats," and "Fire Management Plan." In addition, the document Deschutes National Forest: a Late-Successional Reserve Overview (September 1, 1995) was submitted with both assessments to set the context for site-specific LSR Assessments.

The LSRAs and the associated "Forest Overview" provide an excellent description of the area and its history. It identifies important conditions and processes, disturbance regimes, historic and current uses, and their implications for future management. It also identifies plant and animal species of interest or concern within the LSRs, and addresses connectivity within the LSR and with other LSRs.

Late-successional stand conditions necessary for late-successional species were compared with stand conditions that were considered sustainable under east Cascades fire regimes (as determined, in part, by stand density and fuel loading). The LSRAs developed and documented a strategy that would foster the retention, to the greatest extent practicable, of suitable habitat. This is balanced with maintaining the LSRs in sustainable habitat conditions where maintaining suitable habitat may put LSRs at an unacceptable risk to large-scale stand replacing disturbances.

The difference between "suitable habitat" and "sustainable habitat" required the determination of a balance of vegetative conditions that would allow the LSR to function as intended and be sustainable in the short and long term. The following considerations were factored into quantifying the desired balance:

- Habitat threshold for late-successional old-growth associated species.
- Context of the LSRs within the surrounding landscape and management allocations.

- The "upper management zone" (UMZ) for each "plant association group" (PAG). The UMZ for a given PAG is that point at which tree suppression or mortality begins due to competition.

- The historic range of variability.

- The cycling of structural stages to provide different habitat through time.

Davis—The Forest has divided the Davis LSR into 28 management strategy areas (MSA) based on: (1) common plant association groups, (2) known late-successional associated species, (3) rural interface areas, (4) common silvicultural opportunities, and (5) common fire management strategies. For each MSA the LSRA discusses existing conditions for wildlife, botany, and invertebrates; forest dynamics; insect and fire risk; the social context; and risks. For each MSA, the document also presents treatment criteria, displays management options and identifies monitoring needs. Descriptions of conditions that characterized silvicultural treatments were presented in tabular format with the following categories of information presented for each PAG: snag and downed wood levels (in number of logs, tons/acre and ft^3); canopy cover; canopy layers; and density measures (including the number of trees/acre by broad tree size class).

Metolius—Criteria for developing treatments are described for each of 4 seral classes within each PAG. Under each seral class is a description of (1) the existing stand condition, (2) objectives and thresholds for action, (3) treatment strategies, (4) a description of the resulting stand after treatment, and (5) how the treatment meets LSR objectives. The LSR is divided into 13 MSAs. Current conditions, goals, objectives and management recommendations are described for each MSA. The treatment criteria by PAG and seral class provides sideboards for treatment in specific vegetative conditions; treatments are then further refined by MSA goals and objectives, thus providing guidance for designing future activities within the LSR.

Assumptions

Davis—In reviewing this LSRA the REO assumed that the wording in the LSRA (page 3-28) regarding regeneration cutting will be replaced with the following:

"Overstory removal of trees highly infected with dwarf mistletoe may occur where conditions are such that the developing understory (of the same species) in areas greater than 10 acres will be prevented from reaching late-successional condition. Each large (>21") tree will be considered individually."

Metolius—In reviewing this LSRA the REO assumed that the wording in the LSRA regarding small group treatment (e.g., pages 76 and 82) will be replaced with the following:

Small Group Treatments—Designed to reduce the spread of root rot and subsequent loss of late-successional conditions and natural diversity in vast areas over time by removing susceptible tree species from small (2 to 9 acre) root rot pockets. Where they exist, leave all or most (thin from below if necessary) of the trees of resistant species; e.g., pine and larch. If necessary to maintain some short-term structure, consider leaving 10 to 15 of the largest (>21" dbh) trees of root rot susceptible species, and interplant with seral, resistant species. Also, in order to create a mix of composition and structure across the landscape to benefit development and retention of late-successional conditions, small group treatments can be used to reestablish seral species where no seed source exists because of mortality or the dominance in the stand of climax species.

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In addition, there are locations in the Metolius LSRA that describe ranges of earlier seral conditions or smaller size classes (e.g., Tables 13 & 14; pages 66, 72, 78, 84) that could lead the reader to conclude these conditions are desirable to maintain within the stated range. After discussions with the forest staff, it is understood that these ranges are presented solely to help understand historic vegetative conditions and how that may contribute to sustainable habitats. There is no intention to move a late-successional or large size class stand to an early-successional stage or a smaller size class; the objective for these earlier seral stands is move them towards a late-successional condition.

Additional Comments

Historic Range of Variability (HRV) has been used in this document to help understand historic vegetation composition and fire regimes. While HRV may help determine what amount of late-successional (climactic-climax) habitats can be sustained through time across the landscape, it should not be the sole determinant. The LSR assessment teams considered habitat needs for late-successional species. The teams defined acceptable levels of risk of loss from large-scale stand-replacement events to help determine a logical mix of fire-climax and late-successional structure. The resulting structure will provide for late-successional species as well as meet an acceptable level of risk from large-scale stand replacement events. Such stands could be maintainable outside the historic range of variability. Maintenance of existing late-successional habitats and their associated species is an important component of the NFP, especially for the current planning period and until the more sustainable portions of the LSRs become fully functional.

Conclusions

Based on documentation submitted with and found in the Davis and Metolius LSRAs, field visits by members of the interagency Work Group, discussions held with members of the Deschutes National Forest staff, and the above noted assumptions, the REO finds that the Davis and Metolius LSRAs provide sufficient context and framework for decisions on future projects within each LSR. In addition, silvicultural and salvage activities described in the LSRAs that are consistent with Forest Plan S&Gs and with the respective LSRA objectives and treatment criteria are exempted from further REO review.

cc: REO Reps, RIEC, Tom Nygren, Crescent & Sisters Ranger Districts

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GLOSSARY

GLOSSARY

Activity center -- (Spotted Owl activity center) An area of concentrated activity of either a pair of spotted owls or a territorial single owl.

Administratively withdrawn areas -- Areas removed from the suitable timber base through agency direction and land management plans.

Air quality related values -- Values within Class I areas, such as visibility, biological diversity, and water quality, that under the Clean Air Act, should be protected from the adverse impacts of air pollution.

Aquatic ecosystem -- Any body of water, such as a stream, lake or estuary, and all organisms and non-living components within it, which function as a natural system.

Aspect -- The direction a slope faces.

Biodiversity -- See Biological Diversity

Biological diversity -- (Biodiversity, Diversity) (1) The distribution and abundance of plant and animal communities. (2) The variety of life forms and processes, including a complexity of species, communities, gene pools, and ecological functions.

Candidate species -- Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service for listing as threatened or endangered. Two categories that are of primary concern: Category 1 (C1) - Taxa for which there is substantial information to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work. Category 2 (C2) - Taxa information indicates that listing may be appropriate. Additional information is being collected.

Canopy -- The part of any stand of trees represented by the tree crowns; canopies may occur in layers.

Canopy cover -- The degree to which the canopy (forest layers above one's head) blocks sunlight or obscures the sky. It can only be accurately determined from measurements taken under the canopy as openings in the branches and crowns must be accounted for.

Catastrophic level of habitat loss - Within the sideboards of the ROD, 100's or 1000's of acres, a catastrophic level of habitat loss occurs when the MSA loses its ability to function as habitat for the emphasis species.

Cavity nester -- Wildlife species, most frequently birds, that require cavities (holes) in trees for nesting and reproduction.

Class I areas -- National Parks or Wildernesses that receive the greatest air quality protection under the Clean Air Act's Prevention of Significant Deterioration (PSD) Program.

Clearcut -- An area of forest from which all merchantable trees have been removed by harvesting.

Clearcutting -- A regeneration harvest method whereby all trees (with the exception of advanced regeneration) are removed from an area of the forest.

Climatic climax -- A climax condition that is maintained by climatic factors such as temperature and precipitation regimes and length of growing season; compare with fire-climax.

Climax -- The terminal, theoretically stable, self-perpetuating condition in a series of plant communities that culminates plant succession on any given site in the absence of any major disturbance.

Climax species (or series) -- The tree species predominating on a site at climax, especially in the absence of major disturbances. Sites are often described in terms of the major forest series they belong to. For example, ponderosa pine climax series includes plant associations where ponderosa pine is the dominant overstory species at climax.

Climax vegetation -- The pattern or complex of climax plant communities on a landscape corresponding to the pattern of environmental gradients or habitats.

Congressionally Withdrawn Area -- Areas that require congressional enactment for their establishment such as National Parks, Wild and Scenic Rivers, National Recreation Areas, National Monuments, and Wilderness.

Connectivity of habitats -- The linkage of similar but spatially separated vegetative stands (such as mature forests) by patches, corridors, or "stepping stones" of the same vegetation across the landscape; also, the degree to which similar habitats are so linked.

Cover -- Any feature that provides concealment for fish and wildlife. Cover may consist of live or dead vegetation and geomorphic features such as boulders and undercut banks. Cover may be used for the purposes of escape from predators, feeding, or resting.

Critical habitat -- Under the Endangered Species Act, critical habitat is defined as (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species, when it is determined that such areas are essential for the conservation of the species.

Crown -- The part of any tree containing live foliage.

Defoliating insects -- Insects which feed on leaves or needles of living trees.

Desired Condition -- (Desired Future Condition, Desired Ecological Condition)
(a) A portrayal of the land or resource conditions which are expected to result if goals and objectives are fully achieved. (219 REGS)
(b) A description of the landscape as it could reasonably be expected to appear at the end of the planning period: that is, if the plan goals, objectives, standards and guidelines for that landscape are fully achieved.

Dispersal habitat -- Habitat that supports the life needs of an individual animal during dispersal. Generally satisfies needs for foraging, roosting, and protection from predators.

Disturbance -- An event that causes significant change in structure, function, or composition through natural events such as fire, flood, wind, earthquake, mortality caused by insect or disease outbreaks, or by human-caused events, e.g., the harvest of forest products.

Down woody debris -- Portion of a tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 9 inches in diameter.

Duff layer -- As specifically defined in the FEMAT Report, the layer of loosely compacted debris underlying the litter layer on the forest floor.

Early successional forest -- Forest seral stages younger than mature and old-growth age classes.

Ecological process -- The major actions or events that regulate or influence the function, structure, composition and pattern of ecosystems and that link organisms and their environment, including energy flows, trophic levels (food chains), predation, mutualism, successional development, nutrient cycling, carbon sequestration, primary productivity, decay, hydrologic cycles, and weathering.

Ecosystem -- (a) A community of living plants and animals interacting with each other and with their physical environment. A geographic area where it is meaningful to address the interrelationships with human social systems, sources of energy, and the ecological processes that shape change over time. (b) The complex of a community of organisms and its environment functioning as an ecological unit in nature. (219 REGS/DRAFT)

Ecosystem management -- The use of an ecological approach in land management to sustain diverse, healthy, and productive ecosystems. Ecosystem management is applied at various scales to blend long-term societal and environmental values in a dynamic manner that may be adapted as more knowledge is gained through research and experience.

Effects -- Effects, impacts, and consequences are synonymous. Effects may be direct, indirect or cumulative and may fall in one of these categories: aesthetic, historic, cultural, economic, social, health or ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems).

Emphasis species -- selected for the Management Strategy Areas because it utilizes and best represents a broad spectrum of habitat types in the various plant association groups.

Endangered species -- Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register.

Endemic -- A species that is unique to a specific locality.

Environmental analysis (EA) -- A systematic analysis of site-specific activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary.

Ephemeral Streams -- Streams that contain running water only sporadically, such as during and following storm events.

Even-aged management -- A silvicultural system which creates forest stands that are primarily of a single age or limited range of ages. Creation of even-aged stands may be accomplished through the clearcut, seed tree or shelterwood harvest methods.

Fauna -- The animal life of a region or geological period.

Final Environmental Impact Statement (FEIS) -- The final report of environmental effects of proposed action on an area of land. This is required for major federal actions under Section 102 of the National Environmental Policy Act. It is a revision of the draft environmental impact statement to include public and agency responses to the draft.

Fire-climax -- A climax condition that is maintained by frequent, low intensity fire regimes; compare with fire-climax.

Fire cycle -- The average time between fires in a given area.

Fire frequency -- The return interval of fire.

Fire hazard -- The severity of wildfire occurrence based on existing fuel profiles.

Fire regime -- The frequency, predictability, intensity, seasonality, and extent characteristics of fires in an ecosystem.

Fire risk -- Probability of fire occurrence based on ignition sources (human vs. lightning).

Fire severity -- The effect of fire on plant communities. For trees, it is often measured as the percentage of basal area killed by fire.

Flora -- The plant life of a region or geological period.

Forb -- An herbaceous plant that is not a sedge, grass, or other plant with grass-like foliage.

Forest health -- A measure of the robustness of forests in terms of their biological diversity; soil, air, and water productivity; disturbance ecology; and capacity to supply a sustainable flow of goods and services for humans.

Fragmentation -- The process of reducing size and connectivity of stands that compose a forest. See Habitat Fragmentation.

Fuel -- Dry, dead tree parts which can readily burn.

Fuelbreak -- An area of land on which the native vegetation has been removed or modified so that fires burning into it can be controlled more readily. Some fuelbreaks contain firelines which can be quickly widened with hand tools or by burning.

Fuel loading -- The weight of fuel present at a given site; usually expressed in tons per acre. This value generally refers to the fuel that would typically be available for consumption by fire. Fuel loading varies as a result of disturbance (including human activities), the magnitude of that disturbance, the successional stage of the vegetation, and other conditions of the site.

Green tree retention -- A stand management practice in which live trees as well as snags and large down wood are left as biological legacies within harvest units to provide habitat components over the next management cycle. There are two levels: High level - A regeneration harvest designed to retain the highest level of trees possible while still providing enough disturbance to allow regeneration and growth of the naturally occurring mixture of tree species. Such harvest should allow for the regeneration of intolerant and tolerant species. Harvest design would also retain cover and structural features necessary to provide foraging and dispersal habitat for mature and old-growth dependant species. Low level - A regeneration harvest designed to retain only enough green trees and other structural components (snag, coarse woody debris, etc.) to result in the development of stands that meet old growth definitions within 100 to 120 years after harvest entry, considering overstory mortality.

Habitat -- The area where a plant or animal lives and grows under natural conditions. Habitat consists of living and non-living attributes, and provides all requirements for food and shelter.

Habitat fragmentation -- The splitting or isolating of patches of similar habitat, typically forest cover (but could also apply to grass fields, shrub patches, and other habitats); habitat can be fragmented from

natural conditions, such as thin or variable soils, or from forest management activities, such as clearcut logging.

Habitat type -- The land area capable of supporting a single plant association.

Harvest -- Felling and removal of tree stems from the forest for the manufacture of forest products.

Healthy ecosystem -- An ecosystem in which structure and functions allow the maintenance of biological diversity, biotic integrity, and ecological processes over time.

Herb -- Non-woody vegetation that includes both grasses and broad-leaf plants of low profile, known as forbs.

High intensity fire -- A fire with the capability to be stand replacing or to cause excessive damage to late successional forest characteristics.

High severity fire -- A wildfire event with acute ecological impacts; usually, but not always of high intensity.

Imminent Susceptibility -- A situation where the conditions are such that it is very likely there will be significant change in structure or character of forest stands on a large scale as a result of insect attack and/or fire within the next 10 years.

Impact -- An environmental change that negatively affects a beneficial use or value. The value judgement of "negative" is generally construed to mean that conditions or processes are moving away from desired states.

Interdisciplinary team -- A group of individuals with varying areas of specialty assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze the problem and propose action.

Intermittent stream -- Any non-permanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Landscape -- A heterogenous land area with interacting ecosystems that are repeated in a similar form throughout.

Large-scale fire -- A very large-sized fire compared to the natural range of fire sizes of the fire regime in the geographic area considered. Fires that greatly exceed the typical fire size are often of high intensity and may cause profound fire effects.

Late-successional forests -- Forest seral stages which include mature and old-growth age classes.

Late-successional reserve -- A forest in its mature and/or old-growth stages that has been reserved under the ROD.

Lava flow -- A congealed stream of lava.

Lichen -- A plant consisting of a fungus in close combination with a green or blue-green algae.

Litter layer -- The loose, relatively undecomposed organic debris on the surface of the forest floor made up typically of leaves, bark, small branches, and other fallen material.

Long-term soil productivity -- The capability of soil to sustain inherent, natural growth potential of plants and plant communities over time.

Management activity -- An activity undertaken for the purpose of harvesting, traversing, transporting, protecting, changing, replenishing, or otherwise using resources.

Matrix -- Federal lands outside of reserves, withdrawn areas, and Managed Late-Successional areas.

Monitoring -- A process of collecting information to evaluate if the objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Multistoried -- Forest stands that contain trees of various heights and diameter classes and therefore support foliage at various heights in the vertical profile of the stand.

Mycorrhizae -- An association between a fungus and the roots of a higher plant which improves the plants' uptake of nutrients from the soil.

Mycotrophic -- Feeding on or otherwise being nourished by fungi.

National Environmental Policy Act (NEPA) -- An Act passed in 1969 to declare a national policy that encourages productive and enjoyable harmony between humankind and the environment, promotes efforts that prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the nation, and establishes a Council on Environmental Quality (The Principal Laws Relating to Forest Service Activities, Agric. Handb. 453 USDA Forest Service, 359 p.).

Natural fire rotation -- A fire return interval calculated as the quotient of a time period and the proportion of a study area burned in that time period.

Nesting, roosting, and foraging habitat -- The forest vegetation with the age class, species of trees, structure, sufficient area, and adequate food source to meet some or all of the life needs of the northern spotted owl.

Neotropical -- Relating to or constituting the biogeographic realm that includes South America, the Indies, Central America and tropical Mexico.

Northwest Forest Plan -- Alternative 9 and the preferred alternative of the 1994 Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-growht Forest Related Species Within the Rnage of the Northern Spotted Owl. This plan amends the 1990 Deschutes National Forest Land and Resource Management Plan.

Old growth -- A forest stand usually at least 180-220 years old with moderate to high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.

Old-growth associated species -- Plant and animal species that exhibit a strong association with old-growth forests.

Overstory -- Trees that provide the uppermost layer of foliage in a forest with more than one roughly horizontal layer of foliage.

Park-like stands -- Stands having scattered, large, seral overstory trees and open growing conditions usually maintained by frequent ground fires.

Partial cutting -- Removal of selected trees from a forest stand.

Patch -- An area of vegetation with homogeneous composition and structure as viewed from aerial photography.

Plant Association -- The distinctive combination of trees, shrubs, grasses, and herbs occurring in a theoretical terminal or climax community or a series of communities.

Plant series -- Aggregations of plant associations having the same dominant overstory.

Population viability -- Probability that a population will persist for a specified period across its range despite normal fluctuations in population and environmental conditions.

Precommercial thinning -- The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

Prescribed fire -- A fire burning within an approved, predefined and planned prescription. The fire may result from either a planned or natural ignition. When a prescribed fire exceeds the prescription and/or planned perimeter, it may be declared a wildfire.

Productivity -- (1) Yielding useful or favorable results or involved in the creation of goods and services to produce value. (adapted from Webster)
(2) The growth rate of biomass per unit area, usually expressed in terms of weight or energy.

Project planning -- A site specific application of information gained from watershed analysis to obtain management objectives. Applied watershed analysis.

Range of the northern spotted owl -- The range of the northern spotted owl in the United States is generally comprised of land in western Washington and Oregon, and northern California.

Rate of spread (ROS) -- The rate at which a fire moves across a landscape, usually measured in meters/second.

Record of Decision (ROD) -- A document separate from but associated with an environmental impact statement that states the management decision, identifies all alternatives including both the environmentally preferable and selected alternatives, states whether all practicable means to avoid environmental harm from the selected alternative have been adopted, and if not, why not.

Recovery plan -- A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act, to improve the status of the species to justify delisting in accordance with the Endangered Species Act.

Reforestation -- The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Refugia -- Locations and habitats that support populations of organisms that are limited to small fragments of their previous geographic range (i.e., endemic populations).

Regenerated Areas -- Areas where past regeneration harvest activities occurred and the stands are in early successional stages.

Region -- A Forest Service administrative unit. The Pacific Northwest Region (Region 6) includes National Forests in Oregon and Washington.

Resilience -- The ability of an ecosystem to return to a predicted, desired, or earlier state after disturbance.

Restoration -- Actions taken to return an ecosystem in whole or in part to a desired condition.

Riparian -- Pertaining to land that is next to water, where plants dependent on a perpetual source of water reside.

Riparian area -- A geographic area containing an aquatic ecosystem and adjacent upland areas that directly affect it. This includes floodplain, woodlands, and all areas within a horizontal distance of approximately 100 feet from the normal line of high water of a stream channel or from the shoreline of a standing body of water.

Riparian reserves -- The area adjacent to streams, lakes and wetlands which is designed to protect aquatic and riparian functions and values.

Riparian zone -- Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Roost -- The resting behavior of an animal.

Root disease center -- An infection center in the forest having infected, dead, and dying trees, where the causative agent is a pathogenic root-infecting fungus. Root diseases typically spread underground via fungal growth from diseased to healthy host roots.

Scale -- The degree of resolution at which ecological processes, structures, and changes across space and time are observed and measured. Smaller-scale generally refers to something smaller than a watershed (project-level) and larger-scale is bigger than a watershed (river-basin or provincial). **Note:** this "scale" terminology is opposite of traditional map-scale; that is the ratio of map distance to actual distance. (A map scale of 1:24,000 is a larger-scale map with more detail than on at 1:100,000).

Second growth -- Relatively young forests that have developed following a disturbance (e.g., wholesale cutting, serious fire, or insect attack) of the previous old-growth forest.

Seral -- (1) Successional; (2) A species or a community which will be replaced by another in succession.

Seral stages -- The series of relatively transitory planned communities that develop during ecological succession from bare ground to climax stage.

Series -- An aggregation of taxonomically related associations that takes the name of the climax species that dominates the principal layer. A taxonomic unit in a classification.

Shelterwood -- A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings.

Silvicultural prescription -- A professional plan for controlling the establishment, composition, constitution and growth of forests.

Silvicultural system -- A planned sequence of treatments or prescriptions over the entire life of a forest stand needed to meet management objectives.

Snag -- A standing dead tree.

Stand -- Vegetation occupying a specific area that is sufficiently uniform in composition, size, arrangement, structure, and condition as to be distinguished from the vegetation in adjoining areas.

Standards and guidelines -- The rules and limits governing actions, and the principles specifying the environmental conditions or levels to be achieved and maintained.

Structure -- The physical organization and arrangement of vegetation; the size and arrangement (both vertical and horizontal) of trees and tree parts.

Structural diversity -- The diversity of forest structure, both vertical and horizontal, that provides for a variety of forest habitats for plants and animals. The variety results from layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders create a variety of habitat.

Succession -- A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development of a series of plant communities (called seral stages) following a major disturbance.

Surface fire -- A fire burning along the surface without significant movement into the understory or overstory, usually flame lengths are less than one meter in size.

Sustainability -- The ability of an ecosystem to maintain its organization and autonomy over time including but not limited to maintenance of ecological processes, biological diversity and productivity.

Take -- In this document TAKE refers to the criteria defined by the USFWS that addresses the removal or degradation of spotted owl nesting, roosting, and foraging habitat. "Take" occurs when a spotted owl's home range radius contains less than 40% nesting, roosting, and foraging habitat.

Threatened species -- Those plant or animal species likely to become endangered throughout all or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.

Treatment -- Varying degress of activity that may occur in any of the MSA's.

Underburn -- Burn by surface fire.

Underburning -- Prescribed burning of the forest floor or understory for botanical or wildlife habitat objectives, hazard reduction, or silvicultural objectives.

Understory -- The trees and other woody species growing under the canopies of larger adjacent trees and other woody growth.

Understory fire -- A fire that burns in the understory, more intense than a surface fire with flame lengths of 1-3 meters.

Uneven-aged management -- A combination of actions that simultaneously maintains continuous tall forest cover, recurring regeneration of desirable species, and the orderly growth and development of

trees through a range of diameter or age classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

Upper Management Zone (UMZ) -- This represents the point at which tree mortality begins to occur due to competition for site resources. This is the site-specific density level of trees at which a suppressed class of trees develops. (Cochran et al 1994)

Vegetative composition -- The plant species present in a plant community.

Viability -- The ability of a wildlife or plant population to maintain sufficient size so that it persists over time in spite of normal fluctuations in numbers; usually expressed as a probability of maintaining a certain population for a specified period.

Viable population -- A wildlife or plant population that contains an adequate number of reproductive individuals appropriately distributed on the planning area to ensure the long-term existence of the species.

Watershed -- The drainage basin contributing water, organic matter, dissolved nutrients and sediments to a stream or lake.

WEAVE -- Acronym for the Watershed Analysis process developed by the Deschutes National Forest - [Watershed Evaluation and Analysis for Viable Ecosystems]. It incorporates our ultimate purpose for doing watershed ecosystem analysis... to sustain viable ecosystems. It evokes visions of an intricate tapestry of many colors and textures, each thread having an important function in creating a viable, interconnected whole. It also symbolizes that the work of many others is inextricably woven into the Deschutes process, and that each past and future thoughtful addition will add functionality and strength to the whole effort.

Wilderness -- Areas designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or for a primitive and confined type of recreation; include at least 5,000 acres or are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, education, scenic or historical value as well as ecologic and geologic interest.

Wildfire -- Any wildland fire that does not meet management objectives, thus requiring a fire suppression response. Once declared a wildfire, the fire can no longer be declared a prescribed fire.

Windthrow -- A tree or trees uprooted or felled by the wind.

Woody debris -- See Down woody debris.

ACRONYMS

ACRONYMS USED IN DAVIS LSR ASSESSMENT

ALVI:	*Allotropa virgata* - Candy Stick
ATV:	All-terrain Vehicle
BA:	Basal Area
BECA:	Bald Eagle Consideration Area
BEMA:	Bald Eagle Management Area
CHU:	Critical Habitat Unit
CYMO:	*Cypripedium montanum* -- Mountain Ladyslipper
DBH:	Diameter at Breast Height
DNF:	Deschutes National Forest
FG:	Foreground
FS:	Forest Service
GIS:	Geographical Information Systems
HYPE:	*Hypericum perforatum* -- St. John's wort
HRV:	Historic Range of Variability
IDT:	Interdisciplinary Team
IRT:	Issue Resolution Team
L:	Long-term
LMW:	Lodgepole Moist/Wet
LOS:	Late and Old Structure
LP:	Lodgepole
LPD:	Lodgepole Dry
LPH:	Lodgepole with Mountain Hemlock
LRMP:	Land and Resource Management Plan
LSOG:	Late Structure and Old Growth
LSR:	Late Successional Reserve

LWM:	Large Woody Material
MA:	Management Area
MCD:	Mixed Conifer Dry
MCW:	Mixed Conifer Wet
MG:	Middleground
MH:	Mountain Hemlock
MIJE:	*Mimulus jepsonii* -- Jepson's monkeyflower
MIS:	Management Indicator Species
MSA:	Management Strategy Area
NEPA:	National Environmental Policy Act
NF:	National Forest
NFMA:	National Forest Management Act
NRF:	Nesting, Roosting, and Foraging
NTMB:	Neotropical Migratory Bird
NWFP:	Northwest Forest Plan
Odell WA:	Odell Pilot Watershed Analysis
OGMA:	Old Growth Management Area
PAG:	Plant Association Group
PCT:	Pacific Crest Trail
PETS:	Potential Endangered, Threatened, or Sensitive (Species)
PMR:	Pacific Meridian Resources
PP:	Ponderosa Pine
PR:	Partial Retention
R:	Retention
R6:	Region 6
RD:	Ranger District
REO:	Regional Ecosystem Office

ROD:	Record of Decision
ROS:	Rate of Spread
S:	Short-term
S&G:	Standards and Guidelines
S&M:	Survey and Manage Species
SDI:	Stand Density Index
SPP:	Species
TPA:	Trees Per Acre
UMZ:	Upper Management Zone
USDA:	United States Department of Agriculture
USFS:	United States Forest Service
USFWS:	United States Fish and Wildlife Service
WA:	Watershed Analysis
WEAVE:	Watershed Evaluation and Analysis for Viable Ecosystems