ENVIRONMENTAL ASSESSMENT

GAULDY PROJECT

USDA FOREST SERVICE
SIUSLAW NATIONAL FOREST
HEBO RANGER DISTRICT

Tillamook County

February 2004

RESPONSIBLE OFFICIAL:

GLORIA BROWN

FOREST SUPERVISOR

For Further Information Contact:
George Buckingham
District Ranger
Hebo Ranger District
Hebo, OR 97122

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1. Purpose of and Need for Action

This environmental assessment is written to fulfill the purposes and requirements of the National Environmental Policy Act (NEPA), as well as to meet policy and procedural requirements of the USDA Forest Service. The intent of NEPA, its implementing regulations, and Forest Service policy is to evaluate and disclose the effects of proposed actions on the quality of the human environment. These procedures are meant to improve the quality of decision-making, as well as make the decision-making process more accessible and transparent to the affected public.

Chapter 1 includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Introduction

In 1999, the Hebo Ranger District initiated the Gauldy Projects Environmental Assessment, which analyzed conifer stands, roads, and streams in the vicinity of Gauldy Ridge to determine if actions are needed to improve watershed conditions and habitat for aquatic and terrestrial species in the area. The analysis considered the physical and biophysical resources within an area west of Highway 22, north of Highway 130, and south of Highway 101 (Map 1, Gauldy Project Area).

The 20,391 acre project area includes 12,728 acres of National Forest System (NFS) lands and 7,663 acres of non-NFS lands. The non-NFS lands are made up of industrial timberland, Oregon State lands, and private residences and farms.

The project area is contained within the Nestucca and Little Nestucca Watersheds. The legal description for the Gauldy Project Area is Townships 4 and 5 South, Ranges 9 and 10 West, Willamette Meridian, Tillamook County, Oregon.

Proposed Action

The Siuslaw Forest Supervisor proposes the following actions:

- Commercially thin approximately 854 acres in 30 to 45 year old managed conifer stands.
- Thin, by creating snags or down wood, 100 acres in riparian areas occupied by young, dense conifer stands for the purpose of growing larger trees.
- Perform individual tree release, by creating snags or down wood, on 10 acres for the purpose of growing larger trees.
- Create gaps in alder dominated riparian areas along selected streams and plant a mixture of conifer seedlings species.

- Create snags by girdling or topping in selected non-harvested timber stands.

- Close and decommission approximately 60 miles of the existing 86 miles of Forest and temporary Roads in the Gauldy Project Area.

Complete descriptions of these Proposed Actions are found in Chapter 2, Alternatives.

Purpose and Need for Action

Action is needed in the Gauldy project area to maintain or improve habitat for aquatic and terrestrial species in the area by accelerating the development of late-successional forest habitat and by improving watershed conditions. Actions are also needed to meet the desired future conditions of the amended Siuslaw National Forest Land and Resource Management Plan (Forest Plan).

The National Forest Management Act requires that each National Forest prepare a management plan, which describes how the NFS land within its boundaries is managed for 10-15 years. Each plan establishes goals for the social, economic and environmental resources covered by the plan. The Siuslaw Forest Plan was completed in 1990. It divides the forest into several management areas, each with management goals and standards and guidelines. These standards and guidelines govern management actions by specifying resource conditions to be achieved and maintained.

In 1994, the Forest Plan was amended by the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD), otherwise known as the Northwest Forest Plan. This ROD changed the management direction for about 24 million acres of federally managed land within the range of the northern spotted owl in Washington, Oregon, and California.

The ROD changed the some of the goals of the Siuslaw Forest Plan that emphasized timber and other commodity production, to the development and maintenance of late-successional habitat for the northern spotted owl and other species that use late-successional forest habitat. The ROD established new management and designated areas, and redefined many management area standards and guidelines. It did not change the congressionally designated areas or change existing wilderness areas, which would require congressional action.

The *Final Environmental Impact Statement for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (FEIS)* describes two underlying "needs" (essentially goals) that provide the basis for management of the areas covered by the Plan:

> "The need for forest habitat is the need for a healthy forest ecosystem with habitat that will support populations of native species (particularity those associated with late-successional and old growth forests) and includes protection for riparian areas and waters" (FEIS page S-4)

"The need for forest products from forest ecosystems is the need for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economics on a predictable and long term basis." (FEIS page S-4)

To refine this dual need, an interdisciplinary team reviewed the Gauldy Project Area and identified the existing conditions and the desired conditions for resources in the Area. It identified actions needed to meet or implement changes that would, in the future, meet this dual need and the desired condition. The focus of this review was the conifer stands that are the basis of late-successional forest, the streams that provide habitat for aquatic or water-dependant species, and a road system that provides access to the area and affects various resources of the area.

Existing and Desired Conditions

A. Conifer Stands

Existing Condition

Table 1-1 lists the stand acres on NFS land in the Gauldy Area. The managed stands (plantations) were created in the 50s, 60s, 70s, and 80s primarily by clearcutting. The clearcuts were planted with 300 to 700 Douglas-fir seedlings per acre to maximize growth, and then were to be managed through a series of treatments for timber production. Changes in the Forest Plan goals, lack of funding, and court injunctions slowed implementation of treatments. Many of the proposed treatments were not completed.

Table 1-1: Acres in Managed and Natural Stands.

Stand Ages	Acres
16 yrs. and younger	1,847
15-29 yrs.	1,398
30-45 yrs.	1,790
Subtotal Managed stands	5,035
Natural Stands	7,625
TOTAL	12,660

The young managed stands are interspersed among patches of older aged natural stands. This fragmentation has diminished the amount and quality of the late-successional forest habitat. A goal of the Plan is to maintain and develop, or accelerate the development of late-successional-forest habitat.

29 year-old and younger aged stands

These stands have up to 1,000 trees per acre. They are even-aged and, generally, Douglas-fir is the dominant species. As seedlings grow rapidly in this area, their crowns spread, and often by stand age 10 those crowns begin to grow together, shading out all vegetation that is below them. By this time the individual trees that are best suited to growing on the site begin to establish dominance. Most stands need to be precommercially thinned by age 15, in order to maintain the growth of individual trees. Stands that are twenty years old and younger were recently analyzed for precommercial thinning and prescriptions were prepared for those stands that were in the Gauldy Project Area, approximately 80% of the stands that are between 15 and 29 years old have already been precommercially thinned. Older unthinned stands are very dense and understory vegetation decreases as less light reaches the forest floor. Trees in these unthinned stands are tall and thin, and usually have smaller crowns. In the thinned stands, trees generally are a little shorter, larger in diameter, and wider-based (more taper to the bole) at the ground level. They also have larger, deeper crowns and heavy layers of understory vegetation.

Younger stands in this age class were not treated with site preparation burns and generally have large amounts of down wood in all stages of decay. Older stands were usually burned and the level of down wood in the stand is in direct proportion to the intensity of the burn. There are few snags in these stands and even fewer large green trees to provide snags in the immediate future.

30 to 45 year old stands

The 30 to 45 year old managed stands are even-aged, and single canopied (the crowns are all about the same height). The current average stocking levels of the stands to be treated vary from 183 to 365 trees per acre. The trees are tall and thin, have relatively uniform bole diameters, and have few branches over one inch in diameter. These stands, typically, have 85 to 95 percent crown closure, so little light reaches the ground or lower tree branches. Thus, there are few shrubs, forbs or grasses on the forest floor. Without some type of management, these stands would stay in this condition for a lengthy period.

Due to lower growth rates and crowded conditions, these stands are more susceptible to damage from insects or wind than stands with less stems per acre. These crowded conditions increase the probability that an entire stand or stands could be lost in a single disturbance event. Examination of other stands in the area indicates that wind is the significant disturbance agent. Sustained winds during the wet season that occur in the area can cause significant damage to these structurally weak stands. Due to the fragmented amount of late-successional habitat in the Gauldy Project Area, and the fact that these stands are needed to fill in the gaps, there is need to protect, as much as possible, these stands from stand replacement events.

The dominant species is Douglas-fir. The western stands in the Project Area have some western hemlock mixed with the Douglas-fir and those at lower elevations generally contain some Sitka spruce. There are varying amounts of western red cedar and red alder scattered throughout the Project Area. Swiss needle cast is present in those stands dominated by Douglas-fir. Swiss needle cast causes the growth of Douglas-fir to slow down and may increase the risk of mortality. There is a need in those stands dominated by Douglas-fir to develop a more "natural" mix of hemlock, spruce cedar and alder as appropriate.

Considering down coarse woody debris which is larger than twelve inches in diameter, the proposed units currently contain an average down woody debris loading level which ranges from 689 to 8,807 cubic feet per acre. Most of this down wood is in the older decay classes. Within proposed treatment units, the numbers of snags larger than 7 inches DBH range from zero to twenty three snags per acre; the average sizes of these snags range from 7.5 to 11 inches dbh. In terms of what would be expected naturally, sixteen of the eighteen proposed treatment units are within the high range of coarse wood loading as described within the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*. The remaining two proposed treatment units are within the moderate range. However, to insure that sufficient snags are present there is a need to create about two or more snags per acre in units 8 and 18.

Natural (older) stands

There is no specific information about these stands, since the focus of the review was the young managed stands. Treatment of these stands is not a high priority.

Desired Condition

One of the long-term goals of the Forest Plan for the Gauldy Area is the development and maintenance of large blocks of late-successional forest habitat. Late-successional stand characteristics include some large trees (over 40" DBH) with large limbs and broken tops, multiple canopy layers of shade tolerant species, forbs and shrubs scattered in pockets throughout the stand, numerous large snags (over 20" DBH) and down logs in all decay classes.

For the young managed stands the specific desired condition, over time, is one in which the treated stands have an increased overall mean diameter, increased rate of tree diameter growth and crown development including large limbs and broken tops, stimulated understory shrub and herb development, diverse species composition, increased variation in height of the overstory canopy, increased snag and down wood levels, greater wind firmness, and large trees that could become future sources of high-quality snags and/or down wood.

B. Roads

Existing Condition

The roads in the Gauldy Area were built to support past stand management for intensive timber production, as well as for public access and access to Oregon State and private lands. It was anticipated that the stands on NFS land would be entered frequently, thus providing funds for maintaining the roads. However, due to reduced timber harvest levels on NFS land, road maintenance funding has decreased by approximately 60% in past ten years, and is expected to decline further.

The need for maintenance of roads in the Gauldy Area is directly influenced by the wet climate and steep slopes that some of these roads cross. Without frequent maintenance many of these roads would become impassible. Some of these roads are 30 years old or older, are located on steep terrain, and are built on fill material. These factors combine to increase the probability of failure and the associated adverse affects on downstream aquatic habitat.

Desired Condition

The desired condition is a safe, efficient, and serviceable road system that can be maintained to minimize impacts to terrestrial and aquatic species, while providing access for recreation, forest products, and future management. The present road system does not meet this condition. Actions are needed to close, decommission, or stabilize roads at risk in the Gauldy Project Area as recommended in the January 2003, Siuslaw National Forest Road Analysis and the Nestucca and Little Nestucca Watershed Analyses (October 1994 and June 1998, respectively).

C. Streams

Existing Condition

Many of the streams in the Gauldy Project Area lack the desired levels of large down wood needed to control sediment and provide habitat for anadromous fish and aquatic species. Alder dominates many riparian areas, but this species does not provide a sufficient long-term source of large wood because it has relatively small diameters and decays rapidly as compared with conifers.

The conifer stands near streams in the plantations are crowded, with decreasing growth rates. Without thinning, conifers would develop very slowly or may not develop into large conifer trees regarded as the best source for long-term large wood.

Desired Condition

The desired condition is a mixture of conifer and alder in the riparian zone, with enough conifers, to provide a long-term source of large wood for streams and the riparian zone. A minimum of 10 conifers per 100 feet of stream is desirable.

Decision Framework

The Hebo Ranger District has examined possible stand treatments in the managed stands of the Gauldy Project area to be consistent with the amended Siuslaw Forest Plan. The District has also examined the existing condition of the roads in the Gauldy Project area. The decisions to be made by the Responsible Official will include:

- Should commercial thinning and riparian vegetation treatments be applied to managed stands and riparian areas in the Project Area to accelerate development of late-successional forest habitats, as detailed in this environmental assessment?

- Should the Forest Service close and decommissioning roads in the Project Area so that the road system can be maintain at Forest standards given current fiscal realities, and which will meet the foreseeable transportation needs of the area?

In this context, the Hebo Ranger District has developed and analyzed the effects of the proposed actions (Alternative 2) and various alternative actions (refer to Chapter 2 and 3). The selected alternative will either be the same as the proposed action, or it will be modified based on one of the other alternatives and on public comments.

Summary of Scoping

The comments and information used to develop alternatives came from both the Forest Service Interdisciplinary Team (IDT), and from the public, tribal organizations, special interest groups, and state and federal organizations. On April 17, 2002, soon after the project was initated, the District mailed the Gauldy Project scoping letter to 120 interested individuals and organizations. In addition, public notices soliciting comments about the project were published in the following newspapers:

1. Corvallis-Gazette, April 18, 2002
2. Lincoln City NewsGuard, April17, 2002
3. Tillamook Headlight Herald, April 17 and 24, 2002
4. Sheridan Sun, April 17, 2002

Starting in the fall of 1999, the Gauldy Project has been listed in the Project Update, the Siuslaw National Forest's Schedule of Proposed Actions (SOPA), which is published and mailed quarterly to a Forest mailing list of interested groups and individuals.

Following the solicitation of scoping comments, the Forest Service received 10 letters from individuals and one interest group (the Oregon Natural Resources Council) that were included in the development of issues and alternatives. These comments are located in the project analysis file and are discussed in the Other Issues section located in the Appendix.

Tiering

The proposed actions are designed to meet the Siuslaw Forest Plan Standards and Guidelines. The following is a brief summary of the sections of the Plan and other associated documents that influenced the development and implementation of the proposed actions. No Plan amendment is needed.

Siuslaw Forest Land and Resource Management Plan Direction (Forest Plan)

Forest Plan Management and Designated Areas

NFS lands in the Gauldy Project area are within the following management and designated areas, designated by the Northwest Forest Plan. In general, where land allocations overlap, the more restrictive standards and guidelines apply.

Northern Coast Range Adaptive Management Area (AMA)

The Gauldy Project area is entirely within this Management Area. The emphasis for this area is restoration and maintenance of late-successional forest habitat, consistent with marbled murrelet guidelines (ROD, D-15). The overall objective is to learn how to manage on an ecosystem basis in terms of both technical and social challenges. The primary technical objectives are development, implementation, and evaluation of monitoring programs and innovative management practices that integrate ecological and economic values (ROD, D-1).

Late-Successional Reserves (LSRs)

Late-Successional Reserves are designated areas that cover a portion of the AMA. The LSR goal is protection and enhancement of late-successional and old growth forest ecosystems, which serve as habitat for late-successional and old growth related species. These areas, generally, have larger blocks of late-successional forests. These designated areas include standard and guidelines that direct management actions for the creation and maintenance of late-successional forest conditions. These Standards and Guides are listed in the ROD –pages C9-C21. There are 4,686 LSR acres in the Gauldy Project Area. The proposed actions are designed to meet Standards and Guides in LSRs.

Riparian Reserves

These Designated Areas cover portions of both the AMA and LSRs. Riparian Reserves include lands along streams and unstable areas where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply (ROD B-12). The Standards and Guidelines, listed in ROD C-31-C38, prohibit or regulate activities that may retard or prevent attainment of the nine Aquatic Conservation Strategy objectives. Riparian Reserves cover 9,700 acres in the Gauldy Project Area. The proposed actions are designed to meet Riparian Standards and Guides.

Other Documents

The ROD required that several analysis documents be prepared to guide the implementation of the Forest Plan. These include Watershed Analyses, Late-Successional Reserve Assessments and Adaptive Management Guides. These documents provide existing condition information and contain recommendations for attainment of the desired conditions in the Forest Plan.

Watershed Analysis (WAs)

These documents identify important resource and information needs (data gaps), and describe ecological processes and interactions. They are completed before certain ground disturbing activities can be implemented. The Gauldy Area is included in the Little Nestucca and Nestucca WAs. Information from these documents helped the analysis and describes the existing condition discussed in this Environmental Assessment. They also include recommendations about how to manage the resources in the Gauldy Area. These recommendations include the need to thin the young managed stands, to treat the riparian areas, and reduce the effects of forest roads.

Late Successional Reserve Assessment

The Forest Plan requires that a Late-Successional Reserve Assessment (LSRA) be completed for each LSR or group of LSRs before habitat manipulation activities are designed or implemented. "*The Late-Successional Reserve Assessment for the Northern Coast Range Adaptive Management Area"* was completed January 1998. This Assessment provides a broad scale description of the resources and issues which affect late-successional habitat, describes management objectives and desired future conditions, and provides a context for future decision making. The Assessment includes recommendations for a variety of management activities considered appropriate for achieving the goals of the Forest Plan.

Landscape design techniques were utilized to identify the functional role and condition of the landscape sized blocks within the Assessment area and to prioritize them for treatment. The Assessment divides the area into the three broad Landscape Zones:

- Core Area—Consists of contiguous federal ownership and is intended to provide the genetic source for populations of late-successional species.
- Corridors—Intended to serve as travel routes for far ranging, late-successional species which are dispersing to and from late-successional habitat within and outside the Assessment area.
- Buffers—Intended to serve as refugia for late-successional species in outlying portions of the assessment areas, buffers may facilitate dispersal of late-successional organisms within these portions of the landscape.

In addition to these broad landscape zones, the Assessment area is further divided into Landscape Cells. The current amount and distribution of late-successional vegetation defines the boundaries of each Cell. The Cells and Zones are combined to define treatment priorities across the Assessment area.
The Gauldy Project Area is located in the Core Landscape Zone and the Core Late Seral and Core Mixed Seral Cells. Conifer stands eighty years or older are considered Late-Seral. The goals of the Core Landscape Zone are: 1) Minimize fragmentation to provide large contiguous patches of late-successional habitat and maximize interior forest habitat. 2) Increase connectivity and dispersal habitat within the large interior blocks and develop late-successional habitat in the mixed-seral areas adjacent to the large interior blocks.

The Late Seral and Mixed Seral Cells encompass the largest contiguous blocks of late-seral forest, having at least fifty percent of the cell in late-seral-stage forest. They contain many of the spotted owl and marbled murrelet occupied sties. The minimum late-seral patch size is 2,000 acres. Existing late-successional species populations in these cells provide the foundation for recovery of these species in the assessment area. Management activities which "trade-off" long term gains in late-successional stand composition and structure for short term negative impacts (habitat loss and disturbance) are generally not appropriate. The treatment of these Cells is a high priority.

Management goals within the Late-Seral Landscape Cells include:

- ❖ Manage existing late-successional habitat to avoid activities, which may damage or degrade late-successional characteristics.
- ❖ Emphasize road closures consistent with Access and Travel Management (ATM) Plans/Transportation Management Objectives (TMOs)
- ❖ Identify Key Watersheds and anadromous fish "core areas" which need restoration and apply silvicultural treatments which have high degree of certainty that such treatments will be successful and will accelerate the development of late-successional forest habitat.
- ❖ Treat the complete range of seral stages. Accelerate stands which lack late-successional habitat characteristics through successional pathways by prescribing treatments which set stands on the appropriate trajectories with a limited number of entries.
- ❖ Leave some untreated stands in each of the seral stages to develop on a slow trajectory toward late-successional habitat for the following reasons:
    - Provide a continuous supply of snags.
    - Provide dense hiding cover for wildlife species.
    - Provide untreated stands for comparison with treated stands.
    - Provide dense young stands, often a missing component on this landscape.

The Assessment, on pages 86-101, describes appropriate management activities in the Assessment Area based on existing stand/site condition, seral stage and management objectives. The management objectives include:

- ❖ Maintain site occupancy (conifers and hardwoods) appropriate for plant associations and plant sub series.
- ❖ Maintain tree vigor and health.
- ❖ Encourage natural regeneration.
- ❖ Encourage variation in tree spacing.
- ❖ Retain and encourage diversity of native species.
- ❖ Maintain and restore site productivity.
- ❖ Manage the risk of insect and disease outbreaks.
- ❖ Manage in compliance with Aquatic Conservation Strategy standards and guidelines.
- ❖ Manage road and trail system consistent with Access and Travel Management/ Transportation Management Objectives.
- ❖ Manage in compliance with T&E species objectives.

The Assessment includes specific management objectives based on the stand condition and seral stage. For the those stands that are dense and/or uniform conifer stands in the pioneer seral stage zero to twenty four years old the specific management objective is to grow large trees. For those stands that are dense and/or uniform conifer stands, in the early seral (ages 25 to 49 years old) and mid seral (50 to 79) stages, the management objectives include:

- Grow large trees
- Encourge development of large limbs on some trees
- Encourage windfirmness-avoid excessive windthrow
- Develop multiple canpy layers
- Create large diameter snags and down logs

Adaptive Management Guide (AMA)

The Northern Coast Range Adaptive Management Guide was completed January 1997. The purposes of the Guide were to define how business would be conducted in the AMA, by outlining a process for planning and designing activities. It is also provides a forum for the public to have input on AMA management.

Documents not required by the Forest Plan but developed to provide implementation information and guidance.

Access Travel Management Guide (ATM Guide, 1994)

This Guide was developed in response to declining road maintenance funding and the need to identify a large-scale plan for managing the Forest-wide system of roads. Historically, the Siuslaw National Forest emphasized timber management. A large road system was developed to gain access to these resources. A majority of past road construction and maintenance was paid for through timber revenue. This is not the case today with the decline in harvest levels from the 1980s.

The purpose of this document is to provide clear and consistent direction throughout the Forest for road and trail decisions in response to these changes. Its goals are to promote both safe access for travelers and protection for natural resources. This Guide provides the vision, goals, objectives, criteria and guidelines for managing access for the next five to ten years. This guide does not address off-road vehicles (ORV).

Siuslaw National Forest Roads Analysis, 2003 (RA)

On January 12, 2001, the Forest Service issued the final National Forest System Road Management Rule. This rule revised regulations concerning the management, use and maintenance of the National Forest Transportation System, and requires each Forest to complete a Roads Analysis. The Siuslaw Forest Roads Analysis is designed to provide decision makers with information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficient, and are in balance with available funding for needed management actions. The Forest RA, completed 2003, guides project level road analysis and decisions. It validated the ATM guide selection criteria for Key roads, updated the ATM road selections and now provides guidance for road management decisions.

Issues

Several issues were identified through input from the Interdisciplinary team and as a result of public scoping. The ID team and responsible official considered all pertinent issues and have determined which are relevant, or significant to the proposed action. An issue is significant based upon the topographic distribution (extent), the length of time the issue is likely to be of interest (duration), or the level of interest or resource conflict (intensity). The following four significant issues were used to formulate alternatives and develop design criteria.

Forest Service regulations (1950, chapter 11(3)) require that issues that are not significant to the project or that have been covered by prior environmental review be identified and eliminated from detailed study. Discussion of these issues should be limited to a brief statement of why they will not have a significant effect on the human environment or a reference to their coverage elsewhere. These issues will be listed as Other Issues, Appendix B.

Significant Issues Associated with the Proposed Action

Each issue contains an issue statement, which generally describes the cause and effect relationship of implementing the proposed actions, and one or more concerns that detail these cause and effect relationships. Also, for each concern there are one or more elements that are used to quantify or qualify the effects between the fully evaluated alternatives. These estimates of effects are discussed in Chapter 3 and summarized in Table 3-11-Alternatives Effects Summary Comparison Table, located at the end of Chapter 3.

1. Impacts to Water Quality/Fish Habitat

The proposed activities have the potential to adversely impact water quality and fish habitat by increasing sediment and water temperature in the adjacent streams.

Concern 1

Commercial thinning and slash treatment could degrade water quality by increasing sedimentation. Skidding and decking of logs with heavy equipment has the potential to cause erosion by exposing soil and reducing vegetative cover. Log skidding and temporary road construction can cause soil compaction. Compaction reduces the infiltration of rate of the soils, increasing the potential for surface erosion. Intense fire from burning slash piles may cause damage to the top soil layers and thus reduce production. Severe burns may also cause compaction.

Elements of the Issue:

- Acres of soil compacted by ground-based equipment, temporary road construction, and burned slash piles.

Concern 2

Road use and decommissioning has the potential to influence the amount of sediment that may reach streams and thus degrade aquatic habitat. Use of roads during wet periods can cause rutting, especially on native surfaced (dirt) roads. These ruts may channel sediment into the streams. The more miles of open road, the greater the risk of sedimentation and increased maintenance costs. Conversely, decommissioning and closing roads will reduce the risk of sedimentation and maintenance costs.

Elements of the Issue:

- Number of miles of road reconstruction, construction, and maintenance that would increase the potential for sedimentation
- Number of road miles decommissioned that would reduce the potential for sedimentation.
- Number of miles of open maintained roads after decommissioning.

2. Access to National Forest System lands for Public Use, Private and Oregon State lands

Access to and through the Gauldy Project Area by the existing road system is important to the public, provides access to private and State lands, and provides reasonable and necessary access for managing NFS lands.

Concerns with the proposed road closures and decommissioning:

- Limiting public access to NFS lands for such things as cutting firewood and collecting special forest products.
- Reducing the opportunity for motorized access to hunting areas, and recreation.
- Reducing reasonable access to private industrial timberlands, potentially affecting their land value.
- Eliminating cost efficient access to young managed stands on NFS lands that will be treated to enhance their late-successional development, and which are economically important to local communities.

Elements of the Issue:

- Number of miles of road closed to motorized vehicle use by the public.
- Acres of young managed stands that may not be treated in the future.
- Acres of private and State lands affected by road closures.

3. Road Maintenance Funds

Funds to maintain Forest Roads in the Gauldy Project Area and Forest-wide continue to decline. Presently, there is not enough funding to maintain the existing Forest road system in the Gauldy Project Area to meet the desired condition.

Elements of the Issue:

- Amount of annual maintenance funds.

4. Impacts to T&E wildlife species

The Gauldy Project Area contains habitat for a variety of plant and wildlife species. Management actions have positive and negative effects on these species and their habitats.

There is a concern that commercial thinning and road decommissioning activities would disturb nesting northern spotted owls, marbled murrelets and bald eagles. This may cause a decline in their populations, which is not desirable.

Element of the Issue:

- Acres of northern spotted owl habitat disturbed during non-critical breeding season.
- Acres of marbled murrelet disturbed habitat during critical and non-critical breeding season.
- Acres of bald eagle habitat disturbed during non-critical breeding season.

2. Alternatives

This chapter includes a description of the reasonable range of alternatives developed to respond to the significant issues and need for actions described in Chapter 1. It also includes a list of the design criteria (mitigations) that would be implemented to minimize or prevent adverse effects on environmental, economic, and social resources in the Gauldy Project Area, and be consistent with Siuslaw Forest Plan Standard and Guidelines.

The section, *Fully Evaluated Alternatives*, describes the alternatives that meet the need for actions described above and respond to the significant issues. The section, Other *Alternatives Considered but Dropped* describes the alternatives considered but dropped from further analysis. With each is an explanation of why it was dropped.

Fully Evaluated Alternatives

Alternative 1 No Action

The No Action Alternative is a fully evaluated alternative because it provides the baseline for analysis for the action alternatives. It is required by NEPA (40CFR 1502.14(d)).

In this alternative, none of the managed stands in the Gauldy Project Area would be treated to control density, no riparian treatments would be done, and none of the open Forest Roads would be closed by management actions. Currently closed Forest and temporary roads would remain closed. However, due to a limited road maintenance budget, not all of the roads would be maintained. Those roads that fail may not be repaired. Those that brush-in would remain closed until they are opened for project use.

This alternative does not meet the purpose and need to maintain or improve habitat for aquatic and terrestrial species in the area by accelerating the development of late-successional forest habitat and by improving watershed conditions. The No Action Alternative also does not work toward meeting the desired conditions described in the Chapter 1 of this Environmental Assessment.

Design Criteria Common to All Action Alternatives

To meet the Siuslaw Forest Plan Standards and Guidelines and reduce or prevent the adverse impacts of the proposed actions, the following project design items (mitigations) would be implemented. This list applies to all of the action alternatives (Alternatives 2, 3 and 4). Where design criterion is specific to an alternative, it is found in the description of that alternative.

General

1. The Siuslaw National Forest shall report to the U.S. Fish and Wildlife Service the actual impacts of the proposed commercial thinning and road stabilization projects as required of all proposed projects that may result in adverse impacts to listed species. Reports will include information regarding the actual acres of suitable habitat disturbed and associated acres thinned, the number of suitable trees felled within the adjacent mature stands for safety concerns, as well as the actual dates and duration of project implementation.

Commercial Thinning

Commercial Sale Design

1. Different mixes of Douglas-fir, western hemlock and Sitka spruce be harvested to increase diversity in the treated unit.

2. Trees 20 inches or greater at DBH will not be harvested, except within road and landing clearing limits where larger trees may be removed.

3. All hardwoods would be retained. Those needing to be felled for safety concerns or corridor construction would be retained on site for coarse woody debris (CWD).

4. Trees felled and intended to be retained on site for down woody debris would be felled parallel to the contour of the slope where possible.

5. Green trees with characteristics desirable to wildlife, (broken or forked tops, hollow cavities, or large limbs) will be expected to be retained within the stand in a proportion comparable to the pre-treatment stand condition. This will be accomplished through the silvicultural prescription.

6. When a thinning treatment unit abuts a larger stand of mature forest, a narrow strip of unthinned forest approximately the width of three current tree spacing would be maintained where possible. This would most notably occur in conjunction with units 4, 6, and 12. However, it would not be done when an existing road is located between the treatment unit and older stand. This unthinned strip is expected to serve several purposes including increasing the general diversity of tree spacing and overstory crown development, providing a future source of natural snag and down wood recruitment, and a buffer to further minimize the some potential negative impacts of the thinning and/or risk of logging damage to the older stand. This design feature could reduce the number of trees within adjacent stands of mature forest being determined to be safety hazards and consequently felled.

7. Where appropriate and where funding is available, western red cedar would be planted in forest gaps and identified clearings to increase the species diversity within the area.

8. In addition to the eighteen treatment units, a 40-year-old stand approximately 5 to 10 acres in size, which is adjacent to unit 6 and of a similar age, would be treated with an "individual tree release" treatment to promote the development of late-seral stage forest structure. Focusing on the dominate trees within the stand, approximately 12 trees per acre (or ideally pairs of trees growing within 4 feet of each other), would be release by girdling or felling competing trees within a distance of approximately 30 to 35 feet. If power tools are used to implement this design feature, the work will be accomplished outside of the owl and murrelet breeding seasons (March 1 to September 30).

9. Within the 18 managed-stands proposed for thinning, from 10 to 50 trees per acre would be girdled or cut and left on site in the "no harvest" areas which are especially focused on riparian buffers, to augment existing CWD levels and to encourage the development of scattered larger trees. If power tools are used to implement this design feature, work would be accomplished outside of the owl and murrelet breeding seasons (March 1 to September 30). Up to one hundred acres may be treated if funds are available.

10. Implement protective vegetation leave areas or buffers around all streams near potentially unstable areas and wet sites, to protect riparian vegetation, to maintain stream temperature, and to maintain stream-adjacent slope stability (including headwalls). These areas will not be thinned and harvested.

11. Determine width of buffers based on site-specific factors such as stream order, presence or absence of conifers, and slope-stability conditions. Buffers will at least include the inner gorge adjacent to streams and the active floodplain. Due to National Oceanic and Atmospheric Administration fisheries biologist's concerns, minimum no-harvest buffer widths of 30 feet on perennial streams and 15 feet on intermittent streams will be implemented in all units. No harvest buffers will be wider than these minimum widths except where needed to avoid unstable areas, increases in stream temperature and sedimentation, any areas where thinning is not needed, and areas that cannot be accessed due to logging logistics.

Logging Operations

Table 2-1: **Units by Logging System**

Cable	Ground Based and Horses
Units: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 18, 19, 20 and a portion of 11: Total Acres 766	Units: portions of 1, 3, 4, 8, 10, 11 and 20. Total Acres: 88

1. Felled trees would be topped in the units where it is practical and can be done safely. Tops would remain in the units. The intent is to leave as many tops as possible to act as sediment traps that would help reduce or stop soil displacement. However, it is expected that some of the limbs and tops would be yarded to the landings.

2. Horses and ground-based equipment shall not be used on slopes greater than 30% to reduce soil compaction and displacement. Experience shows it is much easier to control the direction of logs on slopes less than 30%, thus there is less damage.

3. Ground-based skidding equipment shall stay on designated skid trails. Ground-based skid trails would be predesignated and pre-approved before use (LTSR). They should not exceed 15 feet in width, and where practical the skidder, cat or processor should travel on slash. Traveling on slash has been shown to reduce off site soil erosion and lessen soil compaction.

4. Use one-end log suspension on all areas designated for cable yarding systems to reduce soil displacement and compaction, except in areas designated for full log suspension and lateral yarding.

5. Where practical, upon completion of harvest activities, limbs and woody debris should be placed on areas of exposed soil to reduce the potential for off site soil erosion.

6. All existing snags, with the exception of those that need to be cut for reasons of safety and all existing down wood and cut snags would be retained and protected to the greatest extent possible. Cut snags would be left on-site.

7. Directionally fell trees away from buffers to protect riparian vegetation from damage. Retain trees accidentally felled into buffers to minimize stream sedimentation or damage to riparian vegetation. Some trees may be removed as determined by the Forest Service.

8. Limit skyline corridors to less than twenty feet wide. Where skyline corridors pass through riparian buffers, remove no more than 20% of the canopy in any given 1,000-foot reach of stream. Damaged "rub trees" are to remain on site, unless authorized by the Forest Service. Fully suspend all logs yarded over perennial streams. Build skyline cable landings in stable areas with stable cut bank slopes. Use existing landings where feasible.

9. Where cable yarding is planned, design logging systems to yard away from stream channels to minimize soil disturbance on stream-adjacent slopes. If this strategy is not feasible, maintain full suspension of logs over streams.

10. To lessen damage to residual trees, directionally fell trees to the lead of cable corridors.

11. The Survey and Manage buffers would not be disturbed**,** unless for safety and security of those involved in the logging operations**,** during logging and would provide clumps of diversity within the stand after thinning. Where appropriate, fire protection measures would be employed to protect the Survey and Manage buffers should any post-harvest prescribed burning occur.

12. To reduce the risk of spreading noxious weeds, equipment used off Forest Service system roads must be cleaned before entering National Forest System land.

13. To maintain long-term productivity, do not allow the total acreage of all detrimental soil conditions to exceed 15% of the total National Forest land within each harvest unit, excluding roads and landings. Detrimental conditions are those that would reduce the potential of the site to grow trees or vegetation. They include:

- ❖ Mechanical displacement or erosion - removal of at least ½ of the A horizon over an area of at least 100 square feet.
- ❖ Compaction - an increase of at least 20% bulk density at a depth greater that 4" and at least 100 square feet. A 20% increase in bulk density obliterates all evidence of soil structure (compacted soil is a massive block without individual peds) and the Laminar structure of the compacted, massive soil may be evident, but not always occur.
- ❖ Intensely burned soil - complete incineration of duff (surface organic matter above the mineral soil) or at temperatures hot enough to turn the exposed mineral soil in yellow or reddish in color. These changes indicate heating that is sufficient to reduce nutrients and measurably affect long-term productivity.

14. Existing conifer advanced regeneration would be retained. Advanced regeneration is generally defined as "non-merchantable" trees, trees less than approximately 6 inches DBH. Potentially suitable marbled murrelet nest trees are generally those containing branches greater than four inches in diameter or other potentially suitable nesting platforms.

15. Trees in adjacent mature stands which are determined to be potentially suitable marbled murrelet nest trees would not be used as tailholds.

16. Use rock surfacing on all roads used outside the dry season. This would help reduce or stop soil displacement.

17. To reduce sedimentation and road wear, "constant reduced tire pressure" would be used.

18. Water bar and close temporary roads between operating seasons or as soon as the need for the road ceases, to minimize sedimentation from roads. Seed exposed soils with native species (if available) and spread landing slash by machine over landing sites (unless tree planting is planned) and spur roads with native (non-rock) surfaces. This practice would be more cost effective than machine piling and burning of landing piles and would help to stabilize disturbed soils. Native surfaced roads would be seeded with native grass seed as appropriate.

19. Where slopes are greater than 60% immediately below side-cast roads, units 2 and 12, retain two rows of conifers (where feasible and if conifers appear stable) to maintain slope stability

20. **Commercial Sale Operating Season—Felling, Yarding, and Hauling* (dates inclusive) -** To reduce disturbance of northern spotted owls and marbled murrelets, and adverse effects on aquatic species and soils.

Table 2-2: Units by Operating Season

Units	Start felling, road construction, and yarding	Log Haul
9, 13, 14 15	July 8	August 6- Oct 31
4, 6 7, 8, 10, 11, 12	August 6	August 6-Oct 31
1, 2, 3, 5, 18, 19, 20	July 8	July 8-Oct 31

21. Use of horses and ground-based equipment would be restricted to the dry season, from August 6 to October 31, or longer if weather permits.

22. Felling, yarding, and hauling within 1/4 mile of suitable owl or murrelet habitat in occupied or un-surveyed stands shall occur between August 6 and March 1. Within 1/4 mile of suitable habitat in occupied or un-surveyed stands, daily-timing restrictions would limit operations to within 2 hours after sunrise to 2 hours prior to sunset August 6 and September 15. These restrictions apply to all units in the sale.

23. Postpone the falling of safety trees that have potential murrelet nest platforms, or that provide shelter/cover to trees with potential platforms, to as late in the breeding season as possible.

24. If the section of Forest Road 1500, extending from State Highway 130 (Little Nestucca River Road) is used for log-haul, ensure that dust abatement is done within 1/2 mile north of the private homes located near the junction. Also, establish a 20 MPH speed zone in this zone.

25. Trees in riparian buffers that are not designated for harvest but need to be cut to facilitate harvest operations should be dropped into the stream if possible to aid in woody debris recruitment.

Road Management

1. Direction in the ROD requires that, "there will be no net increase in the amount of roads in Key Watersheds. That is, for each new mile of road constructed, at least one mile of road should be decommissioned, and priority given to roads that pose the greatest risks to riparian and aquatic ecosystems." To meet the intent of this direction, the density or adverse effects of existing system[1] (permanent) or non-system (permanent) roads in the Gauldy Area would be reduced by a mileage that is at least equivalent to that of any new roads being constructed. Consider temporary roads not decommissioned in the same dry season they are built in this mileage reduction. Roads to be decommissioned or effects to be reduced will be identified before, or at the same time as, new temporary roads are built, if they are to remain open for more than one dry season (semi-permanent). Roads that serve a sale unit may be decommissioned up to five years after the sale closes.

2. For projects requiring heavy equipment, develop a spill plan and assure materials would be available to prevent and control the entry of fuel, hydraulic oil, or other chemicals into streams. Have a "spill response kit" on the project whenever equipment is operating. A spill response kit must be sufficient to absorb 34 gallons of oil and designed to float on the surface, while absorbing oil and repelling water. The kit needs to meet or exceed the physical properties of a "New Pig Products Spill Kit #408".

A. Temporary Roads

1. A team of planners and engineers would review road project sites before preparing road design plans for timber sale contracts. Planners and engineers would review any changes in design plans before incorporating them into contracts.

2. Do not reuse existing temporary roads where road stability is a major concern.

3. Limit new temporary spur roads to stable ridges to minimize soil disturbance. No new Forest System roads would be built. Where feasible, design the logging plan to minimize the need for new temporary roads

4. If the horizontal alignment of temporarily reopened roads needs adjustment, favor the cut bank side of the road prism to minimize disturbance to side-cast areas and established vegetation.

5. Scatter slash and stumps created from road building in the stands.

[1]*NOAA Fisheries road definitions*: Permanent road--a road that is useable after the end of the contract; semi-permanent road--a road that is used for longer than one dry season but is decommissioned at the end of the contract; temporary road--a road that is built and decommissioned during the dry season of the same year, usually May 15 to October 15.

6. A watershed specialist, such as a hydrologist, soil scientist, or geologist; would evaluate temporary roads used for timber removal to determine need for ripping or subsoiling. If ripping is to be done by the timber-sale contractor, roads to be ripped shall be identified in the timber-sale contract. Avoid subsoiling in areas where residual tree roots may be adversely affected.

7. Minimize the risk of turbidity reaching coho habitat from temporary culvert installation and removal. Install a minimum of two temporary dams below each of the perennial stream crossings in Units 1 and Unit 9 prior to installing and/or removing culverts. (This would require one culvert in each unit.) Dam may be constructed using straw bales, silt fences, or native materials such as alder, conifer or brush. Dams shall be placed at the downstream end of the largest pools, or low gradient reaches, closest to the culverts to maximize settling of suspended particles.

8. Replace water bars, remove temporary culverts, and close roads maintained specifically for the project when project is completed. Appropriate closure devices generally include earthen mounds or large boulders. Purchasers would be responsible for replacing closure devices that were removed for harvest operations. These requirements would be included in the timber-sale contract or waived if they do not apply.

B. Existing Forest Road System

1. Where water bars are temporarily removed from Forest Roads to facilitate harvest operations, add rock if needed at these sites to maintain a hardened road surface and reduce the potential for erosion.

Fire and Fuels Management

1. To reduce fire risk and create fuel breaks, treat fuels in commercial thinning stands within one mile of private land residences are located. At a minimum, pile and burn slash within 200 feet of property lines. To potentially eliminate the need for burning, consider whole tree yarding and slash disposal on the landings. Whole-tree yarding may be used if agreed to by a soils scientist or hydrologist. Decisions on whether to implement whole-tree yarding would be made case by case.

2. Slash generated from commercial thinning along Forest Roads 1500 and 1533 would be piled and burned within 25 feet slope distance of the road, except in units 19 and 20 where slash would be piled and burned within 50 feet of the road.

Road Decommissioning

1. Culvert removal would be done in dry weather to reduce surface erosion resulting from exposed soil conditions. Place limbs and woody debris on exposed soil to provide sediment traps. This would help reduce or stop soil displacement.

2. Remove failing sidecast material where the potential for material entering streams is moderate to high.

3. Erosion control methods would vary among sites, and would be based on the amount of sediment that has the potential to enter stream channels and the expected effects of sediment on aquatic biota. Erosion control shall focus on fill removal, slope stability, cut slopes adjacent to stream channels, road surfaces, and sediment plains within stream channels. Monitoring of erosion sources from past road decommissioning projects has found that most sediment is produced from the in channel sediment plain as the stream adjusts its gradient. Some sites may not require any erosion control while others may require treatments that are more extensive. In general, treatment intensity is directly related to cut slope steepness and length, road compaction adjacent to cut slopes, natural seed sources, and the volume of sediment that has accumulated upstream of the road crossing (sediment plain within channel).

4. Fill Removal - Complete fill removal is expected to occur at all culvert removal sites with defined stream channels. Partial fill removals may occur at a few sites, only after a fish biologist or watershed specialist is consulted, if fills are extremely deep, contain material that is too large to move (such as large boulders), or would result in adverse impacts. Complete fill removal shall consist of removing all fill that extends from each edge of the natural valley floor width up to the road at approximately 1.5:1 slope, except where natural slopes are steeper. When natural slopes are steeper, only the fill between the natural slopes shall be removed. Partial fill removal shall remove the same wedge of fill as a full removal would, except that portion of the fill that is too deep to reach or that which may cause adverse effects. Full removals shall remove the culvert, whereas partial removals may leave the culvert functioning in place. All fill removal shall be carefully done to minimize sediment inputs into stream channels from the fill material.

To minimize the risk of turbidity reaching coho habitat install a minimum of two temporary dams below the perennial stream crossings near the end of the 1589 road prior to removing the culvert. Dams may be constructed using straw bales, silt fences, or native materials such as alder, conifer or brush. Dams shall be placed at the downstream end of the largest pools, or low gradient reaches, closest to the culverts to maximize settling of suspended particles.

Stack waste material only in areas that are stable and generally greater than 50 feet away from stream channels. Contour waste piles to about 1.5:1 slope to minimize potential for surface erosion or mass soil movement. Allow waste piles to become vegetated naturally or use erosion control (tree limbs and tops, seed, planting, etc.) where there is moderate to high potential for surface erosion.

5. Slope Stability - Unstable or potentially unstable sites, such as sidecast and road fills in stream channels, that have the potential to enter stream channels shall be stabilized during road decommissioning.

6. Cut Slopes - Erosion control on cut slopes which are created by fill removal and adjacent to stream channels shall include seeding and/or brush placed parallel to the slope when there is a moderate to high risk of erosion affecting aquatic resources. Erosion is most likely when slopes are steeper than 1.5:1 or their length exceeds twenty feet. Seeded areas shall not be fertilized. Minimize seeding in areas where red alder seed sources exist.

7. Road Surfaces - Road surfaces and other compacted areas adjacent to roads (i.e. dispersed camping sites) shall be treated to decrease water concentration on the surface. Treatments may include subsoiling with a winged ripper, ripping, out-sloping, or waterbarring. Surface treatments shall extend across the entire width of the road and to the edge of each cut slope. The ripper shall be pulled away from the excavated channel and not into it. Waterbars may be constructed on the road just above the excavated channel at some sites to prevent erosion on adjacent channel cut slopes. Waterbars shall be located in areas where drainage would not destabilize road fills.

8. Sediment Plains Within Channels - Woody debris, such as locally available alder and brush from the decommissioning work or adjacent to the road prism, shall be placed in stream channels perpendicular to stream flow where 3 cubic yards of sediment or greater is expected to erode from the channel as the stream adjusts its gradient during high flows. Smaller sediment plains shall also be stabilized when wood debris can be easily obtained near the site.

9. The Road Stabilization project has been designed to minimize the potential impacts to spotted owls, marbled murrelets and bald eagles. Activities that generate noise above the ambient noise level would be prohibited between January 1 and July 7. Additionally, noise-generating activities between July 8 and September 15 would be restricted to the daily time period between two hours after sunrise to two hours before sunset (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season). Noise-generating activities conducted as a part of the Road Stabilization project may occur as soon as July 8, as with the Gauldy Thinning project. However, activities on those roads or road segments which are within 0.25 miles of an occupied murrelet site or a concentration of relatively higher quality, late-seral stage habitat, would generally be scheduled to be implemented after August 5.

Action Alternatives Descriptions

The following section discusses those alternatives that would result in changes to the Gauldy Project Area by management actions. First in the alternative descriptions is how the young managed conifer stands and alder in the riparian areas would be treated, and second how the roads would be managed. The design criteria listed above applies to all of these alternatives.

Alternative 2 – The Proposed Action

This alternative includes a description of proposed commercial and streamside thinning, individual tree release, snag creation, riparian planting, and how the roads used by commercial sale operations and those not related to these operations would be managed.

Conifer Stands

Alternative 2 would reduce the number of stems in young, managed conifer stands by commercial thinnings, and other stand treatments. Table 2-3 shows the proposed stand treatment methods, acres, implementation dates, and Management or Designated Areas where they would occur.

Table 2-3: Description of Alternative 2

Acres	Stand Age (years)	Treatment Type	Acres within Forest Plan Land Allocations	Implementation date
854	30-45	Commercial thin	AMA: 490 LSR: 374 Riparian Reserve: 465	2003-2008
100	30-45	Streamside thin	Riparian Reserve	2006-2010
10	30-45	Individual Tree Release	LSR	2004-2009
N/A	30-45	Snag creation	LSR	2004-2010

Commercial Thinning

Alternative 2 would treat approximately 854 acres in 18 units. The Gauldy Project Map 1 shows the unit locations. The stands proposed for treatment are densely stocked and lack a diverse structure.

Stand management goals for these units are:

- Promote development of those trees that have the best crowns and size by reduction of the number of stems to between 80 and 140 trees per acre by removal of the smaller diameter trees.
- Thin to a level that would allow individual tree development and not jeopardize the integrity of stand from being blown down. This level of thinning makes it likely that these stands would benefit for thinning again in about 10 years to further assist their development.
- Thin to variable densities in the stand with "leave tree clumps" at 140 to 370 trees per acre and from ¼ to 44 acres in size. Create openings of various sizes (¼ to 1 acre in size) that contain 0 to 40 trees per acre.
- Underplant western red cedar in selected areas.
- Maintain or increase tree and understory vegetation species diversity

Units with a low to moderate risk of windthrow would be thinned using diameter limit prescriptions (all trees in certain size ranges would be harvested, trees above and below those sizes would be left). Diameter limit prescriptions would be applied to Units 2, 3, 4, 6, 7, 9, 11, 12, and 20, and to portions of Units 8, and 13. This prescription should result in the stands having highly variable densities following treatment.

The thinning prescription for units with a high to moderate risk of windthrow would be "designation by description". This treatment prescription prescribes that the largest trees in the stand are retained and trees within 13, 14, or 15 feet of them are harvested. This type of prescription would leave more trees per acre and results in a more even spacing of the leave trees. Stands treated in this manner are more likely to be wind firm initially and should become more wind firm if they do not blow down in the first 5 years following treatment. Later entries can open the spacing between trees farther, further develop wind firmness, and create the desired variability. Units 5, 13, 15, 18, and 19 and portions of Units 8 and 13 are prescribed for designation by description.

Unit 1 has a low to moderate risk of windthrow and currently has the largest trees and most variable understory (mostly shrubs and herbs) of all the stands proposed for treatment. Additionally, the stand is slightly more variable than other young managed stands proposed for treatment. The focus of the prescription would be opening up the largest trees (19" dbh and larger) in the stand to continue their rapid growth and development. Areas more than 30 feet away from the larger trees will be marked for removal to develop clumps of smaller diameter trees.

Unit 10 has a moderate risk of windthrow, while the risk in Unit 14 is moderate to high. Since these stands are in the Adaptive Management Area and outside of the Late Successional Reserves, individual trees would be marked for removal, rather than designation by description. The goal of the marking prescriptions is to slightly increase the variability within the stand while maintaining wind firmness.

Commercial Thinning Operations

To accomplish some of these stand management goals and provide forest products to local communities, a combination of ground-based equipment including horse and cable yarding would be used to remove an estimated 12 MMBF/24,000 CCF. Table 2-4 shows which system would be used for each treatment unit.

Ten or fewer individual green trees or snags within the older natural stands adjacent to the commercial thinning units may need to be felled as safety hazards. Some of the larger trees in these adjacent [2]natural stands may be used for cable tailholds.

Table 2-4: Alternative 2 Units by Logging System

Cable	Ground Based/Horses
Units: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 18, 19, 20, and portions of 11. Total Acres 766	Units: portions of 1, 3, 4, 8, 10, 11 and 20. Total Acres: 88

Fire and Fuels

In order to reduce wildfire risk, slash created by commercial thinning treatments would be piled and burned within 200 feet slope distance, in those units within 1/4 mile of structures or improvements on private land. Piling and burning may not be necessary if whole tree yarding and disposal of slash on landings is done.

Streamside Thinning

Areas along streams would not be harvested within commercial thinning units to protect physical integrity of the perennial and intermittent streams and banks, maintain shade, and minimize sediment input from commercial thin operations. These "no harvest areas" areas range from 15 to 200 feet on both sides of the stream channel based on local site conditions. About 100 acres of these areas are occupied by young dense confers. In those areas dominated by Douglas-fir, 10 to 15 trees per acre would be girdled or cut and left on site to encourage the development of 10 large trees per acre and to improve species mix. Work would be done after commercial operations are completed.

Individual Tree Release

A 40-year-old stand approximately 5 to 10 acres in size and adjacent to unit 6, would be treated with an "individual tree release" treatment to promote the development of late-seral stage forest structure. Focusing on the dominate trees within the stand, approximately 12 trees per acre (or ideally pairs of trees growing within 4 feet from each other), would be released by girdling or felling competing trees within a distance of 30 to 35 feet.

[2] Natural stands: Stands on National Forest Land that have not been treated by some management action

Snag Creation

Up to 4 snags per acre would be created in units 8 and 18 by girdling or removing the top half of the crown.

Riparian Planting

Riparian planting would be done in selected areas along the following streams, an unnamed stream: NW1/4 Sec. 31, T4S., R9W.; Woods Creek, Sec. 5, T5S. R9W.; and Bear Creek, Secs., 24 and 13 T5S., R10W. Alder dominates the areas that would be treated. Existing openings in the alder canopy would be used or enlarged to about ¼ acre by cutting and leaving alder, planting a mixture of conifer species, releasing with chainsaws the planted seedlings from competition with shrubs and hardwoods, and protecting the seedlings from animal damage with tubes or nets. In areas where conifer exist but are overtopped by alder, a few alder would be cut and left. No alder would be cut within 15 feet of streams.

Road Management

The road management proposal for this alternative is shown on Gauldy Project Map 1 and summarized in Table 2-5. Roads or segments would be decommissioned if not needed for future management and they could damage downstream aquatic habitat resources if they fail. These roads are marked red on the map. Roads needed for future management and which are not high risks to adversely affect downstream aquatic habitat would be stabilized, closed to vehicle travel, and retained on the Forest Service Road System at Maintenance Level 1. They are the green roads on the map. Roads open to public travel are the black lines on the map. The following table summarizes the Proposed Action changes in road management.

Table 2-5: Alternative 2 Road Miles by Maintenance Level

Present Status	Miles	Proposed Action	Miles
***Forest Roads**-Maintenance Levels			
Level 1	3.2		28.3
Level 2	49.0		29.0
Level 3	17.1	None	0
Level 4	None	None	0
Level 5	None	None	0
****Temporary Roads**	17.0	.2 mile	0
Decommissioned Roads	N/A		29.0
Total	86.3		86.3

*Forest Roads—Roads on the Forest Road and Trail System.
**Temporary Roads—Existing Roads not included in the Forest Road and Trail System. These roads are typically short segments used to access cable landing. They are closed to public travel and maybe re-opened for project use and then closed.

Several Forest Roads would be decommissioned that provide access to about 578 acres of industrial private land and 116 acres of Oregon State land.

Specific Design Criteria for Alternative 2

1. Maintain roads that access stands in the wildland-urban interface. Treat roads with rolling waterbars to facilitate access for initial-attack equipment. Close (guard rail or gate) and sign roads for administrative use only that require restricted public access. The district hydrologist, fire management officer, and transportation planner would determine closure type and locations. Forest Roads requiring treatment are the 1503 and 1588.

Alternative 3 Private Land Access

Alternative 3 proposes ways to maintain road access to private land. This alternative responds to concerns from the Simpson Resource Company about the proposed decommissioning of several Forest Roads that provide reasonable access to their land. The stand treatments and riparian planting would be done as described in Alternative 2. Table 2-6 compares the changes proposed by this Alternative and Alternative 2-Proposed Action. Access to Oregon State land is decommissioned.

Table 2-6: Private Land Access--The following Forest Roads provide access to private lands

Forest Road No.	Proposed Action	Private Land Alternative
2200-119	Road gated closed, Maintenance Level 1	Private land portion remains gated closed. NFS land portion, Maintenance Level 1.
2200-120	Road gated closed	Private land portion remains gated closed. NFS land portion, decommission.
1588-112	Decommission	This road provides reasonable access to private land and young managed stands on NFS land. The goal, with cooperation of the private landowner, is to maintain this road on the landscape. This road would be stabilized by removal of some of the fill over the culverts, and installation of waterbars. Removal of a large portion of the fill would allow the road to be used in the future and reduce the risk of down stream damage if the culverts do fail. The road would be closed to public travel. Removal of the culverts was deemed too expensive and may result in undesirable effects on aquatic resources because the fills are deep, and would require construction of short road segments down and across steep stream banks to reach and remove the culverts.
1533-113	Road closed, Maintenance. Level 1	Would be the same as the proposed action (Alternative 2).
1588-120	Decommission the portion across NFS land	Portion across NFS would be managed under a Road Use Permit to the private landowner. The road would be closed to public travel.

Alternative 4 Minimal Road System

In this Alternative only the Key Forest Roads 1500 and 1533 would remain open for public travel for high clearance vehicles only (Maintenance Level 2). The remaining open Forest roads that access private and Oregon state land across National Forest System Land would be decommissioned.

This alternative best responds to the need to provide a Forest Road system that is safe and protects aquatic resources with the limited road maintenance funds that the district receives annually. This road system meets the recommendations of the Forest ATM Guide and Forest Roads Analysis.

Table 2-7--Comparison of Fully Evaluated Alternatives

This table displays a comparison of the results of the various proposed actions of the fully evaluated alternatives.

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Private Land Access	Alternative 4 Minimal Road System
Vegetation Management				
Commercial Thinning--Acres	0	854	854	854
Stream Side Thinning--CWD creation-Estimated Acres	0	100	100	100
Individual Tree Release--Acres	0	10	10	10
Riparian Planting –Estimated Acres	0	10	10	10
Logging/Road Use				
Ground skidding/horse (acres)	0	88	88	88
Skyline Yarding (acres)	0	766	766	766
Temporary Road Construction (miles)	0	.2	.2	.2
Specified Road Construction (miles)	0	0	0	0
Specified Road Reconstruction (miles)	0	0	0	0
Road Management				
Miles of Forest Road Decommissioned	0	*12.0	*10.0	*52.2
Miles of Forest Road open to public use	66.1	29.0	29.0	17.1
Miles of Forest Road retained on the Forest Service System, Maintenance. Level 1.	3.2	28.3	30.3	0
Miles of Road on the landscape, but managed under Road Use Permits.	0	0	3.0	0
Existing Temporary Road miles	17.0	N/A	N/A	N/A
Private land access	No change	Eliminated	Maintained	Eliminated
Oregon State land access	No change	Eliminated	Eliminated	Eliminated
30 to 45 year old stand acres that may not be treated due road decommissioning	N/A	542	393	1,089

*Excludes existing and proposed temporary roads, because they are considered closed.

Monitoring

Since the proposed actions are considered routine, no specific monitoring of the effects of any of the implemented actions would be done. Those areas in the Gauldy Project Area affected by the proposed actions would be included the Siuslaw National Forest's monitoring plan.

Alternatives Considered but Dropped from further Analysis

No Commercial Thinning Alternative

Trees would be cut and left on site. No road construction or opening of existing roads is needed. To ensure that bark beetles do not damage the stand, 4 to 6 trees per acre would be cut in four-year intervals. It would take 120 to 130 years to reach the desired condition. This alternative assumes that funding would remain available at a consistent level.

Discussion: This alternative responds to issues 2--Impacts to Water Quality/Fish Habitat and 3--Road Maintenance Funds, by avoiding logging and road use. This alternative was dropped because it does not meet the need for action of developing late-successional forest habitat characteristics in the young managed stands in a timely manner. Ongoing research indicates that thinning dense stands at a young age over a relatively short time to low densities is the best treatment method to develop multi-layered stands with a good species composition mix that would support biodiversity. This alternative does not do this. By the time the target density per acre is achieved, the trees may be mature, but the stands would lack late-successional characteristics. It also does not meet the second part of the dual road maintenance funds need for action to provide forest products.

Helicopter Yarding in all Stands Alternative

This alternative differs from the Proposed Action by the use of a helicopter to remove the trees cut in all units.

Discussion: This alternative responds to issues 1 – Impacts to Water Quality/Fish Habitat and 3. Road Maintenance Funds. This alternative dropped because:

1. The forest product manufacturing industry, in recent discussions, states the use of helicopters is not realistic in the near future for projects similar to this because of rising fuel costs and lower wood product values for small diameter wood. The economic efficiency of helicopters versus conventional methods may not be realized for years, if it at all. This alternative, then, does not meet the need for action of providing forest products in a reasonable and environmentally sound manner.

2. To prevent adverse impacts to T&E wildlife species, the helicopter-operating season would be restricted to October 1 through December 31. Experience indicates that operating a helicopter in the Coast Range during the winter months is not economically feasible, because of limited flying days due to rain, fog and wind.

3. With the need to restrict logging to only being done in the winter, the cost to upgrade the roads for winter haul would be prohibitive.

All Project Actions Completed outside T&E Birds nesting seasons Alternative.

This alternative responds to Issue 3. – Road Maintenance Funds. The intent of this alternative is to reduce disturbance to the northern spotted owl, marbled murrelet and bald eagle during the nesting season. All activities would be done October through December. To minimize potential adverse effects to aquatic habitats, all roads associated with commercial thinning must be substantially improved to support winter season log hauling. This would include upgrading all the road surfaces with gravel, and installation of various devices to control sedimentation. No ground based or horse logging would be done, all units would be cable logged.

Discussion: This alternative dropped because:

1. The costs to improve the roads, and install and maintain improvements to protect aquatic habitat would be prohibitively high.

2. Removal of culverts and associated fills is required to be done during July through September to protect aquatic resources. This alternative means that some of the work needed to decommission roads would not be done, and if these areas fail may affect adversely affect downstream aquatic habitat.

Delay Noise Producing Activities until August 6 Alternative

This alternative responds to Issue 3. – Road Maintenance Funds. This alternative differs from the Proposed Action by doing the commercial thin and road decommissioning operations from August 6 through October 31.

Discussion: This alternative was dropped because:

1. The shortened operating season may make commercial thinning operations infeasible.

2. The season in which culverts and their associated fills could be removed is substantially reduced and would significantly raise the costs of completing the road decommissioning activities.

3. This alternative would not completely remove disturbance effects. It may lessen it, but because the effects of disturbance and its influence on the dynamics of the affected populations are not known, it is difficult to determine exactly what the differences in effects would be between this alternative and the Proposed Action Alternative.

4. The proposed actions, if implemented, are not unique. Actions similar to these have and are being implemented across these species habitats. Monitoring indicates significant effects are not occurring.

5. The amount of area that may be affected by the proposed actions is very small when compared to these species large population areas.

No Vegetative Treatments in Riparian Reserves Alternative

In this alternative, no vegetation treatments would be done in these Reserves. This alternative responds to Issues 1 – Impacts to Water Quality/Fish Habitat and 3. – Road Maintenance Funds.

Discussion: This alternative dropped because:

1. The total area that may be commercially thinned outside Reserves is about 400 acres. However, this acreage consists of small areas scattered throughout the Gauldy Area, which makes them economically infeasible to do. This may result in many stands not reaching the desired conditions.

2. Actions similar to the proposed have been done across the Siuslaw National Forest. Monitoring shows they can be done with minimal effects.

Variable Density Commercial Thinning Alternative

The Coast Range Association submitted a comment that suggests that recent research indicates that variable density thinnings may accelerate the development of late-successional characteristics better than the proposed actions.

Discussion: This alternative dropped because variable density thinning is being implemented where ever feasible in all of the action alternatives. However, some of the commercial stands proposed for thinning are very crowded, with small crown and root development. Doing variable thinnings at the rate suggested by the information submitted by the Coast Range Association, may result in these stands blowing down, which does not meet the Forest Plan goals of protection and enhancement of late-successional forest habitat.

3. Affected Environment and Environmental Consequences

INTRODUCTION

This Chapter describes the physical, biological, social and economic conditions that may be affected by the fully evaluated alternatives described in Chapter 2. In some Environmental Assessments (EAs) and most Environmental Impact Statements (EISs), the existing conditions and environmental consequences have been presented in separate chapters. They are combined into one chapter for this EA to lessen repetition, reduce the length of the document, and provide a format in which existing conditions can be easily compared with predicted effects.

As directed by the Council for Environmental Quality (CEQ) implementing regulations for National Environmental Policy Act (NEPA), the discussion focuses on resource conditions in the Gauldy Project Environmental Assessment, associated with the significant issues and concerns presented in Chapter 1. The description of the affected environment succinctly describes the environment of the areas to be affected by the four fully evaluated alternatives. Only those descriptions necessary to understand the effects of these alternatives are provided.

Environmental consequences are discussed in terms of direct, indirect and cumulative effects. Direct effects are caused by implementing proposed activities and occur at the same time and place. Indirect effects are caused by implementing proposed activities and occur later in time or further removed in distance, but are still reasonably foreseeable. Cumulative effects result from incremental impacts of proposed activities when added to other past, present and reasonably foreseeable future actions regardless of what Agency or person undertakes such other actions. Some resource conditions consider a larger area if predicted effects extend beyond the Gauldy Project Area.

Access/Transportation

Introduction

The roads in the Gauldy Project Area directly or indirectly affect almost all activities and resources that occur in the area. They allow the area to be used for a variety purposes, including recreation, past, present and future resource extraction and management, and have positive and negative effects on recreation, aquatic and terrestrial wildlife resources. In an effort to define their influences, their effects are discussed in each resource they affect. This section discusses the effects of the four fully evaluated alternatives as they relate to road maintenance funding, and access to private and State managed land.

Existing Condition and Trends

The categories of roads in the Gauldy Project Area are: Classified National Forest System Roads (Forest Roads) and Temporary. Classified Forest Roads (Forest Roads) are on the National Forest Road system and used to manage the resources of the Area. They provide access to the Area for the public and administrative needs. The types of Forest Roads are Key and non-Key Roads. Key roads provide long term access routes for administrative and public needs. These roads generally connect to state, federal, county or community routes forming connections into and through the Gauldy Project Area. Non-Key Roads are generally closed to public travel, but retained on the Forest Service Road System because they are needed for administrative needs, i.e. foreseeable future projects, fire control access. Temporary roads are typically one-time use roads. Usually they are short segments used to access the conifer stands for stand management purposes and then closed to vehicle traffic.

Road Maintenance

The roads open to public travel have either native surfacing (dirt) or gravel. To reduce maintenance costs and sediment from some Forest Roads, but allow them to remain open, waterbars were installed in 1990s. These Roads are passable by high clearance vehicles. Maintenance on them is minimal.

The wet climate and steep slopes greatly enhances the need to maintain the Forest Roads in the Area frequently. Many of the Forest Roads have not been maintained for years and are impassible either due to being brushed in or have failed. Some of these roads are thirty years old or older, and are located across steep side-slopes and built on fill, which without maintenance increases the probability of failure. If they do fail, adverse affects to downstream aquatic habitat may occur.

Maintenance activities include brushing, grading, culvert replacement, maintenance of drainage ditches and surfacing repair or replacement. To properly maintain these roads some of these activities need to be done annually, which is not being done. Each Forest Road is assigned a maintenance level i.e. 1, 2, 3 etc. based on the road management objectives assigned to each road. Limited funding is prioritized to Key forest roads leaving the open non-Key Roads generally not maintained except during periods of project activity. Non-Key roads may be closed between project activity periods.

The ATM Guide and Forest RA placed the Forest Roads, in the Gauldy Project Area, in the maintenance categories shown in the Table 3-1. The Guide recommends that Forest Road 1500 and 1533 be maintained open for public travel. They are maintained at Level 3. However, their Road Management Objectives is Level 2 and it is expected, in the future, they would be maintained at this level. The other Forest Roads either remain on the Forest Road system but are closed to public travel (Maintenance Level 1) or decommissioned. Due to the lack of funding, some the Forest Roads designated in the Guide for Maintenance Level 1 have not been closed.

Table 3-1: Road Maintenance Categories

Present Status	Miles	Proposed Action	Miles
***Forest Roads**-Maintenance Levels			
Level 1	3.2		28.6
Level 2	49.0		29.0
Level 3	17.1	None	0
Level 4	None	None	0
Level 5	None	None	0
****Temporary Roads**	17.0	.2 mile	0
Decommissioned Roads	N/A		29.0
Total	86.3		86.3

Road Maintenance Funding

The trend is for less open roads, because there are not sufficient funds to properly maintain the present road system. The annualized cost to properly maintain the existing Key and non-Key Forest Roads in the Gauldy Project Area is about $40,000 or about $570.00 per mile. There are 215 Forest Road miles, both Key and Non-Key miles, on the Hebo Ranger District. The amount of annual funding needed to maintain this these road miles is about $123,000. The Hebo Ranger District annually receives about $80,000 for road maintenance. The District's Key Roads are maintained first and the Non-Key second. The lack of funding means many of the non-Key Roads receives no maintenance. It is anticipated that the District would receive less maintenance funds in the future.

Private and Oregon State Land Access

Several Forest Roads in the Gauldy Project Area access about 578 acres of private land and 116 acres of State land. These access routes are the most reasonable way to access these lands. Due to steep slopes and streams and Oregon State land use regulations, reasonable access across these lands is not feasible at this time.

Analysis of Direct and Indirect Effects

Access to the Gauldy Project Area is a significant issue, Chapter 1 page 1-14-, Issues 2 and 3). One concern is road maintenance funds to maintain the Forest Roads within the project area continue to decline. Presently there is not enough funding to properly maintain the existing Forest Roads. The other concerns are decommissioning some of the Forest Roads would reduce access to private and State lands, and reduce public access to the Area.

Alternative 1 No Action Alternative

None of the Forest Roads in the Gauldy Project Area would be closed by management actions. However, due to reduced maintenance funding, some of the roads in the area would become impassible as roads fail or brush in. Exactly which roads this would occur to cannot be determined. It is anticipated that those roads built on side-slopes and/or constructed on fill would fail sooner than the more stable roads. These roads include 15,000 cubic yards of soil fill material. Due to limited and sporadic maintenance, some of the roads that access private and State lands may fail and may not be repairable due to cost or location.

Alternative 2 Proposed Action

More effective road maintenance is expected to occur for roads that remain open to public use, than would be provided in Alternative 1 No Action because there would be fewer miles to maintain. The estimated annual costs would decrease from $40,000, with the No Action Alternative, to about $14,000.00 with this alternative. However, because maintenance funding in this alternative is still limited, the quality may be such that some of the roads fail and cannot be repaired or would brush in. This alternative does treat roads that are considered a risk to aquatics. Some roads could fail due to the lack of maintenance.

Decommissioning the Forest Roads that access the State and private lands may affect these adjacent property owners through reduced property values. The exact change in value is difficult to quantify due to economic dynamics over time, and each land parcel may alternative access from private or State land, but likely at a higher cost.

Alternative 3 Private Land Access

This alternative differs from Alternative 2 Proposed Action in that it changes the treatment of about 2 miles of Forest Roads that provide access to private land. The effect on the District's road maintenance budget would be small. Therefore, the effect on road maintenance funds described in the Alternative 2 would be similar for this alternative. However, this alternative differs from Alternative 2 in how some of the roads would be treated. The fills would be reduced in most areas, but the culverts would still remain, reducing the risk of adverse impacts to aquatics, but not eliminating that risk with the trade-off that reasonable access to private land is maintained. This would result in a slightly higher risk of road failures than in Alternative 2.

The private landowner and the Forest Service would share maintenance costs on roads that the Forest Service has deemed necessary for the future, and that also provide access to private land. Private owners would be responsible for maintenance costs of those roads not needed by the Forest Service. This cost may further reduce the value of their lands due to an increase in operation or management costs, but would slightly reduce Forest Service road maintenance costs. Roads that provide access to 80 acres of State Land would be decommissioned.

Alternative 4 Minimal Road System

This alternative would result in the highest level of road maintenance for all remaining open Forest Roads on the District, as there would be fewer miles to maintain. The annual estimated maintenance cost is $11,000.00 as compared to $40,000 in the No Action Alternative, and approximately $14,000 for Alternatives 2 and 3. It eliminates access across National Forest System Land to private and Oregon State Land. This alternative does treat those roads considered at risk to aquatics, and therefore lessens the risk of road failures the most of all of the alternatives.

Access/Transportation-Cumulative Effects

On National Forest System land, the trend is for fewer open Forest Roads in the Area. This is dictated by the goals of the Forest Plan, the need to meet the desired future condition, and the lack of road maintenance funds.

Private and State Land Development – The road development on State and private land is difficult to determine. It is expected that some development would occur where it is feasible, but the amount is expected to be small due to unstable steep slopes, deep stream crossing, and Oregon State rules and regulations that govern activities on these lands. The cumulative effect would be the sum of the lost value of those parcels that cannot be reasonably accessed. The amount of this cumulative loss is unknown, because the value of each parcel is different and changes over time.

Other Activities - Other foreseeable actions include noxious weed control, public recreational use, forest products gathering for personal and commercial uses, and fire and fuels management. Due to less road access, the ability to use and manage the various resources where road access is needed would be reduced.

Soils

Introduction

A study of the land and soils in the Gauldy Project Area provides a basis for understanding the existing condition of the area. Soil is a basic resource of the forest, and is the Key to the productivity of an area. Maintenance of soil productivity is dependent on protecting the soil surface from erosion, displacement and compaction. Management actions do not affect factors such as climate and soil parent material. However, management activities can affect soil nutrients and structure.

The Siuslaw National Forest Soil Resource Inventory (published in 1974) provides basic soil, bedrock, and landform interpretation for management interpretations. A copy is on file at the Hebo Ranger District. Soil descriptions are included in the Forest Plan, Little Nestucca and Nestucca Watershed Analyses. These documents and the Soils Report for the Gauldy Project discuss four factors that describe the existing condition.

Existing Condition and Trends

Stability

The term stability, generally, applies to geologic or bedrock stability. In this case it applies to surface or soil movement. The Gauldy Project Area is located in the Coast Range physiographic province. It lies on either steep, stable, shallow-soiled side slopes or deeper stable, gently sloping uplands of eroded Tertiary volcanic strata and/or bedded sediments of sandstones and siltstones.

Rotational soil failures or slump type earth flow terrain is not common, and that which is present is relatively old and long stabilized. Dry raveling is the dominant surface erosion process on the coastal slopes greater than sixty percent, and typically occurs in those areas where presence of surface vegetation is minimal. Most stands thirty to forty years old currently have little understory vegetation and bare soil is common in many units because of the lack of sunlight to the forest floor. The five to thirty year old stands are somewhat more open. However, as they continue to grow and the canopies close, more areas would become exposed to erosive forces.

Debris chute type of slope instability has not been an active agent in the down slope movement of soil in most of the Gauldy Project Area in the last hundred years or so. Recent intense rainstorms from 1996 to 2000 did not produce any additional soil failures within the proposed units in this study area. Only a couple of small (less than 0.1 acre), shallow, debris chute type, soil failures, were observed during the field reconnaissance. Located within Unit 12, these failures occurred soon after the initial harvest of the units, likely in the 1970's, and have since began to stabilize. The roads in the area may have some "local" effect, but most have stabilized. As the number of road miles decrease the trend is to have less stability concerns.

Productivity

The soils in the Gauldy Project Area are highly productive silt to gravelly loams formed on a variety of bedrock materials from bedded sediments to volcanics. Side slopes and soil depths are highly variable, but soil moisture and temperature regimes are very favorable for soil biological activity and plant growth on most sites.

An important ingredient to soil productivity is the presence of down wood. These stands were harvested 30 to 40 years ago when utilization was less intense than in more recent decades. Extensive concentrations of down logs are present in some areas. Many of the stands were also burned when duff retention standards were not in place. Consequently, in some areas, little or no decomposing organic matter remains.

Clearcutting and burning the units removed or reduced the organic layers of the soil. This reduced productivity. However, since these practices have ceased on National Forest Land, soil productivity should improve over time.

Another aspect of long term nutrient availability and ectomycorrhizal formation is the amount of larger woody material retained on site. The amount of large, down wood in the proposed commercial thinning units is highly variable, ranging from low to high levels, as defined in LSRA. Each unit's management activities would be planned to maintain enough large woody debris (dead and down) to provide for a healthy forest ecosystem and ensure adequate nutrient cycling.

Increasing human activities in the Gauldy Project Area have led to increased levels of soil disturbance and reduced soil productivity. The one management activity that has the most direct impact on soils on the NFS land portion of the Gauldy Project Area is roads. Impacts from roads persist until the road is totally reclaimed, subsurface drainage patterns restored and organic matter again accumulates on the surface. Site productivity would remain somewhat less on reclaimed roads than on similar undisturbed sites for a period of time.

Road building affects soils by removing and displacing the topsoil layers from the road prism and compacting the road surface and shoulders. The surface of the road would not support trees and other forest vegetation as long as the road is used and maintained. Trees and shrubs would grow along the road bank, but site productivity is less than in unaffected soils. Native surface roads (unpaved) would grow trees and other forest vegetation again when uses and maintenance ceases. However, site productivity would be significantly less than similar undisturbed soils.

Roads also disrupt hydrologic processes that occur within the soil profile. The road prism interrupts the lateral downslope, subsurface water flow. This water accumulates in the road ditch, if present, or the road surface. If sufficient water accumulates, erosion occurs which can cause sediment to reach a stream. The trend is for less open roads in the Gauldy Project Area. Therefore, overtime productivity should improve.

Compaction

Much of the Gauldy Project Area is underlain by easily eroded bedrock; the area probably has a naturally high sediment production rate from exposed areas. However, the rate or amount of displacement and sedimentation that may occur is difficult to determine on a large area because the slope and slope aspect are constantly affected by changing variables such as the time and amount of rainfall, presence and kind of vegetation, and time and effect of disturbance agents.

Existing compaction in the Gauldy Project Area is estimated to be 207 acres, or 1.6% of the Gauldy Project Area. This includes existing roads, Forest and temporary, gravel pits, cable yarding landings and rock outcrops. About 190 acres is in the roads. This is well within the Regional Standard that compaction up to 20% is acceptable.

Compaction in the 0-15 year old stands is very small, because most ground in the area is too steep for tractor usage and most plantations were cable yarded, which had a minimal affect on soil compaction or displacement. Where tractors were used, the existing older compaction is constantly being ameliorated by freeze/thaw and bioturbation (root growth and animal borrowing).

Mechanized activities associated with timber harvest and fuels reduction can disturb soils in four ways: displacement, compaction, puddling, and removal of organic matter. Displacement can occur when the upper layer of soil is removed or mixed with underlying layers during harvest or site preparation. The most common causes of displacement are log skidding or piling slash with a bulldozer. Some types of bulldozers tend to displace soils when they turn, and dozer-piling slash often results in soil mixing. Compaction occurs when heavy equipment used in skidding or site preparation breaks down soil structure, and thereby reduces the pore space within the soil. This happens most commonly when heavy machinery (dozers, skidders, mechanized fallers) make repeated passes over the same ground, particularly during times of high soil moisture. Puddling is severe compaction that severely limits the infiltration of water. Generally, soils are most susceptible to compaction and puddling when their moisture content is above eighteen percent. At this threshold, the ability of soil to support heavy equipment is greatly reduced. Compaction, puddling, removal of organic matter and displacement lessen site quality and soil productivity. The trend is less compaction over time.

Analysis of Direct and Indirect Effects

Cumulative impacts to soil productivity due to compaction from timber harvest and road management activities were identified as a concern (Chapter 1 page 1-13, Issue 1). This section also discusses the effects of the action alternatives on stability and productivity.

One measurement indicator for this concern is the percent detrimental soil disturbance /compaction for each activity area, and a comparison with the 20% guideline specified in Forest Service Handbook 2509.18 (22). Finally, the analysis would describe the direct, indirect and cumulative effects of reduced soil productivity due to detrimental soil disturbance associated with the alternatives.

Alternative 1 No Action

Some instability may occur if the existing roads fail. These failures would be small slumps. Major landslides are not expected to occur. Compaction should improve over time as the freeze/thaw and bioturbation (root growth and animal borrowing) processes continue.

Stands would continue to develop. Most stands currently have little understory vegetation and bare soil is common in many units because of the lack of sunlight to the forest floor. Intermediate and suppressed trees would slowly be removed from the stand through mortality and decay. In areas of heavy stocking, stands would stagnate. In general, plant diversity would diminish as well as soil biota because of the lack of sunlight.

Alternative 2 Proposed Action

Thinning promotes tree growth. Crowns increase in size and root systems expand. Evapotranspiration rates increase. These factors all promote greater slope stability. Field review of previously thinned units has shown no increase in slope instability in either the uplands or riparian reserves. Thinning within and through riparian reserves improves long-term slope stability as stand conditions change with release and increased tree growth. Thinning should emphasize the retention of a well-distributed stand of larger trees, both conifer and hard wood. These larger trees also provide the stream the opportunity to better withstand the assaults of windstorms and floods over time.

Compaction

The two sources are compaction from commercial harvest operations and the existing roads that remain on the landscape.

The major source of compaction (and also much disturbance) is ground based skidding equipment. Unrestricted tractor yarding and tractor piling are not considered an option on those landtypes where side-slopes are gentle enough (generally less than 30%) to support tractor usage. The silty nature of the fine grained soils, and evidence that significant soil moisture is available most of the year indicate that any type of unrestricted tractor yarding and piling (even low ground pressure) would lead to unacceptable soil compaction and/or disturbance. Restricted tractor yarding from predesignated skid roads is considered an option if the adversely affected area is less than 15% of the activity area. With tractor yarding, skid roads are predesignated, (approved in advance of use by the Timber Sale Officer) and generally 150 to 200 feet apart. With a processor/forwarder system the skid roads are usually only about 50 to 60 feet apart, but the number of trips for each individual road are substantially less than with skidding.

Monitoring has shown that when designated skid roads are properly utilized in conjunction with line pulling and directional falling, compaction from ground based tractor operations generally remains at about 9% to 11%. Finally, much of the ground-based harvest may be implemented with horse logging methods. This is likely the case for Unit 11, and the ground based parts of Unit 4 and 10. Horse logging impacts approximately one half the area that mechanical systems impact.

Skyline operations in thinning units with small wood and intermediate supports usually impacts less than one percent of the unit area. The effects of the commercial thinning are summarized in the following table. Ground based mechanized harvest was used to calculate acres impacted.

Table 3-1: Soil Impacts Table

Unit Number	Acres	Logging Method	Acres-ground based	*Acres Impacted	Roads-Acres	Total Acres Impacted	Total % of Unit
1	52	Skyline, some ground	6	0.5+0.6=1.1	2.5	3.6	6.6
2	20	Skyline	0	.2	.9	1.1	5.5
3	54	Skyline, some ground	6	0.5+0.6=1.1	1.0	2.1	3.8
4	52	Skyline and ground	13	0.4+1.3=1.7	0.4	2.1	4.0
5	44	Skyline	0	0.4	0.7	1.1	2.5
6	71	Skyline	0	0.8	0.5	1.3	1.8
7	91	Skyline	0	0.9	2.9	3.8	4.2
8	67	Skyline, some ground	7	0.7+0.7=1.4	0.8	2.2	3.3
9	42	Skyline	0	0.4	1.2	1.6	3.8
10	27	Skyline and ground	16	0.1+1.6=1.7	0.4	2.1	7.8
11	39	Ground	39	3.9	0	3.9	10.0
12	55	Skyline	0	0.6	0.2	0.8	1.4
13	120	Skyline	0	1.2	0.3	1.5	1.2
14	37	Skyline	0	0.4	0.6	1.0	2.7
15	40	Skyline	0	0.4	0.1	0.5	1.2
18	3	Skyline, some ground	1	0+0.1	0.2	.3	10.0
19	15	Skyline	0	0.2	0.1	0.3	2.0
20	21	Skyline	0	0.2	0.1	0.3	1.4
Totals	**852**		**88**	**16.7**	**12.9**	**29.6**	**3.4%**

*Assumes 1% of skyline acreage and 10% of ground based.

In this alternative, about 29 miles of existing Forest and temporary roads would be decommissioned or considered decommissioned. Decommissioning may include removal of culverts, subsoiling the travelway and revegetation. The total compaction changes from 207 acres to 158 acres. Overtime the productivity of the soils would increase in those decompacted areas.

Some roads proposed for decommissioning are midslope roads built on fill, with stream crossings that have deep fills. Decommissioning them reduces the risk of them failing. If they do fail, some slumping, debris torrents, and/or small landslides may occur and may, depending on the location and amount of material associated with the instability, result in sediment reaching fish bearings streams in the area.

Displacement

Some soil displacement would continue from exposed areas, but should be temporary as the disturbed areas revegetate. However, by following the design criteria listed this EA, effects should be slight. As more light reaches the ground in the thinned stands more vegetation would grow. Some sediment is expected from culvert removal and open Forest Roads.

In this alternative the slash would be lopped and scatted in the units, except along a few main roads and near private properties where slash would be pulled away from the boundaries, piled and burned. This helps provide material for nutrient recycling. Opening the stand would also increase growth of other vegetation, which increases nutrient cycling.

On typical thinning, hand piles number about 40 per acre and occupy about 20 square feet per pile for a total of about 800 square feet per acre or about 1.8% per acre. Burning the piled slash may develop sufficient heat to affect the underlying soil. However, pile burning is usually done in the spring or winter months when duff and soil moistures are higher. This helps reduce heat effects on soil. Consequently, burning in this manner is considered a minor effect when considering the limited overall acreage involved.

Alternative 3 Private Land Access

The effects of this alternative are very similar to the Proposed Action. About 3 miles of the Forest Roads proposed for decommissioned in the Proposed Action Alternative would not be done in this alternative. These roads would be stabilized and closed to public travel. The anticipated effects include:

A. A slightly greater risk of down slope failure than Proposed Action because some of the fill on the culverts in the Forest Road 1588-112 would remain in place.
B. While the Proposed Action Alternative would result in 158 acres of compaction. This alternative would result in about 160 acres due to roads being left on the landscape.
C. Productivity: Would be slightly less than the Proposed Action Alternative because more compacted surfaces would remain.

The effects of the other actions in the Proposed Action would be the same.

Alternative 4—Minimal Road System

Except for Forest Roads 1500 and 1533, the remaining Forest Roads are decommissioned. The anticipated effects are:

A. Least risk of instability of all the alternatives because most roads are either decommissioned or stabilized and closed to public travel, and there is a higher probability that maintenance on the two open Forest Roads would be more frequent.
B. Reduces the amount of compaction from about 207 to 54 acres
C. Most of the compacted areas returned to production.

Soils-Cumulative Effects

At this time, no single unit of measure of long-term soil productivity is widely used. Information on the survival and growth of planted seedlings may indicate short-term changes in site productivity. However, the relationship between short-term changes and long-term productivity is not fully understood at present. Experience indicates that the potential impacts on soils are best evaluated on a site specific, project-by-project basis. The major soils concerns –compaction, nutrient productivity, and instability – are most effectively evaluated, for both short and long term effects, at the project level. With proper project implementation of the design criteria listed in this EA (Chapter 2) unacceptable cumulative effect on the soil resources are not anticipated from any action alternatives. In fact, none of the actions proposed would cumulatively exceed the 20% standard, and further a results of these actions would see a decrease in the level of existing compaction.

Generally, the effects to the soil factors have occurred during past activities. All of the action alternatives would improve the three soil factors over time. There may be slight increases in compaction and displacement from road decommissioning and temporary road construction but they would be temporary. Some sediment may occur from road maintenance of graveled surfaced roads, however better maintenance would reduce the levels to small amounts.

Private Land Development - Activities associated with continued development of private land for residences would result in both long-term and permanent reductions in soil productivity. Areas cleared for houses and driveways would receive extensive soil disturbance and corresponding loss in productivity. Activities on the surrounding private land may also be a source of sediment. The type and timing of these activities is not known, so it is difficult to determine what may result.

State Land—The Oregon State lands in the Gauldy Project Area are managed under a series of rules and regulations whose goals are soil protection, as much as possible. This trend is expected to continue.

Other Activities - Other foreseeable actions include noxious weed control, road maintenance, administrative road use, public recreational use, and small forest products gathering for personal use. These activities do not involve the use of heavy equipment other than on existing road surfaces. Based on the types and extent of these uses in the Gauldy Project Area, no detrimental soil disturbance is anticipated.

Aquatics

Introduction

Past activities associated with timber harvest, stream treatments, and road construction and maintenance have had the greatest effects on aquatic resources in the Gauldy Project Area. These effects include 1) Sediment produced from gravel and native surfaced roads that reaches streams. 2) Removal of large wood during logging operations to help fish pass-through, due to a past theory that this large down wood blocked fish passage. 3) Conversion of conifer stands along streams dominated by large trees to alder. 4) Young crowded conifer stands with low growth rates located along or near streams. The concern is that these stands may not develop large diameter conifers to be the future source of large wood for the streams.

Existing Condition and Trends

The source for the following discussion is the *Gauldy Project, Biological Assessment (BA) USDA Forest Service, Siuslaw National Forest, Hebo Ranger District, October 15, 2002*. This document includes an analysis of several condition factors used to define the existing condition and evaluates and determines the effects of the proposed actions on Oregon Coast coho salmon, listed as Threatened under the Endangered Species Act, and the aquatic species on the Regional Foresters [3]Regional Sensitive Plant and Animal List.

[3] Sensitive Species—Those species that have appeared in the Federal Register as proposed for classification and are under consideration for official listing as endangered or threatened species that appear on an official State list or that are recognized by the Regional Forester as needing special management to prevent their being placed on Federal or State lists.

The analysis area (Effects Area) in the BA encompasses seven 7th field subwatersheds of the Lower Nestucca, Three Rivers, Little Nestucca, and McKnight 6th field watersheds. This area is larger than the Gauldy Project Area. National Oceanic and Atmospheric Administration dictates the size of the Effects Area. The location of the Gauldy Project Area and these watersheds is shown on Gauldy Map 2. There are no Key Watersheds in this Area.

Watershed Conditions

Road Densities--The Nestucca and Little Nestucca WA's indicate that all subwatersheds are not properly functioning due to road density or roads adjacent to streams. Current road densities are summarized in Table 3-2. The trend is a reduction in road miles on federally managed land in these watersheds due to reduced maintenance funding.

Table 3-2: Road Density by 7TH Field Watersheds

7th Field Watershed	Acres	Total Road Miles	Forest Service Road Miles	Total Road Density mi/mi2	FS Density mi/mi2
Lower Nestucca	10074	69.4	9.0	4.4	0.6
Lower Three Rivers	5183	30.6	14.8	3.8	1.8
Alder/Buck	4493	18.0	9.6	2.6	1.4
Fall	2614	20.4	14.3	5.0	3.5
Clear	3408	25.4	15.1	4.8	2.8
Austin/McKnight	5296	39.3	26.9	4.8	3.3
Bear1	2341	18.2	17.9	5.0	4.9
Total	33409	221.2	107.6		
Average	4773	31.6	15.4	4.3	2.6
Maximum	10074	69.4	26.9	5.0	4.9
Minimum	2341	18.0	9.0	2.6	0.6

Disturbance History--All subwatersheds have been extensively impacted by past timber harvest and settlement activities and they are not properly functioning. The trend is improvement of this condition on NFS land over time.

Stream influence zone--Riparian vegetation has been substantially altered in all subwatersheds and they are not properly functioning. The trend is improvement of this condition on NFS land over time.

Refugia--Professional judgment assumes that habitat refugia are at risk in all subwatersheds. The trend is improvement of this condition on NFS land over time.

Stream Condition/Fisheries

According to the Watershed Analyses, the Nestucca and Little Nestucca watersheds contain 203 and 39 miles respectively. The Gauldy Project Area contains about 3.8 miles of coho habitat on NFS land although the proposed actions have the potential to affect coho habitat on private land through downstream effects. Several natural waterfalls prevent upstream migration of adult coho, limiting their distribution in the project area. Coho salmon habitat is located as close as 0.13 miles of thinning units and as far away as 2.20 miles. The locations of Chinook and Coho salmon habitat in the project area are shown on Gauldy Project Map 1.

Water quality

Temperature --Thermograph data indicates that Fall Creek is properly functioning; Bear1, Austin/McKnight; Alder/Buck, and Lower Three Rivers are at risk, and the Lower Nestucca is not properly functioning. There is no data for Clear subwatershed but based on adjacent data and professional judgment it is assumed to be at risk. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Turbidity--No quantitative data exist on turbidity in any subwatershed. Professional judgment was used to assume that all subwatersheds are at risk. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

One source of sediment is the existing road system. The Key and Non-Key Forest Roads have gravel surfaces and with some maintenance are not significant sources of sediment. The old roads that access the units are for the most part native surfaced, overgrown with vegetation, and show little to no active erosion. Most of these roads have solid sub-grades, which are suitable for dry season haul with, perhaps, a little spot rocking in a few critical areas. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Chemical contamination--The Lower Nestucca subwatershed is 303(d) listed for excess bacteria (fecal coliform) and is not properly functioning. No data exists on chemical contamination in any other subwatershed. Professional judgment assumes that Clear, Alder/Buck, Lower Three Rivers, and Fall Creek subwatersheds are not properly functioning, Austin/McKnight is at risk, and Bear1 is properly functioning. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Overall-303d listed Streams

The Lower Nestucca is on the Oregon Department of Environmental Quality's 303(d) list of water quality limited streams for high summer stream temperature, bacteria, and flow modification. No other subwatersheds are listed at this time. Project actions are designed to prevent increases in stream temperature in all subwatersheds. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Habitat access

Physical barriers--Lower Nestucca, Lower Three Rivers, Alder/Buck and Austin/McKnight subwatersheds are assumed to be not properly functioning based on road locations. All other subwatersheds are assumed to be properly functioning. The Highway 101 culvert on Hartley Creek (Lower Nestucca) was field reviewed and appears to be a barrier to upstream passage of juveniles and adults salmonids. A long time resident (since 1950's) used to observe "salmon" upstream of this culvert until the channel downstream of the culvert was deepened. Since the deepening no salmon have been observed upstream of Highway 101 by this resident. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Habitat elements

Substrate--Stream surveys indicate that Clear and Bear1 subwatersheds have primarily gravel and cobble substrates with low amounts of fine sediment, whereas McKnight and Small Creeks (Austin/McKnight subwatershed) have higher amounts of fine sediment. Based on stream surveys and professional judgment Clear, Bear1 and Fall Creek subwatersheds are properly functioning. Austin/McKnight is at risk, and Lower Nestucca, Lower Three Rivers, and Alder/Buck subwatersheds are assumed to be not properly functioning. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Pool area--Stream surveys and professional judgment indicate that pool area is at risk in all subwatersheds. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Pool quality--Professional judgment assumes that Lower Nestucca and Lower Three Rivers are properly functioning. Stream surveys and professional judgment indicate that pool quality in Clear, Bear1, and Fall is at risk and professional judgment indicate that Austin/McKnight and Alder/Buck are not properly functioning. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Pool frequency--Professional judgment assumes pool frequencies are at risk in all subwatersheds. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Off-channel habitat--Professional judgment assumes off-channel habitat is not properly functioning in all subwatersheds. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Large woody debris--Stream surveys and field observations indicate that Clear and Bear1 subwatersheds are at risk. Stream surveys and professional judgment indicate that the remaining subwatersheds are not properly functioning. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Air photos and field verification indicate that streams within and adjacent to units in the Gauldy Project Area have sufficient abundance of small woody debris (SWD) from deciduous and conifer species and an adequate source of small trees to provide future SWD to maintain these functions. The most limiting wood debris size class in the Project Area coho habitat is large woody debris over 24 inches in diameter.

Although small diameter wood does function in both small and large streams, its effect on aquatic processes is much different than large wood. Large wood is much more effective at forming deep pools, storing sediment, creating floodplain habitat and connecting the aquatic and terrestrial ecosystems than is small wood in all stream sizes. Removal of riparian wood sources from past activities has reduced large wood much more than small wood considering small wood abundance recovers much more quickly than large wood.

Channel condition/dynamics

Stream bank condition--Professional judgment assumes that stream bank conditions in Lower Nestucca are not properly functioning and all other subwatersheds are at risk. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Floodplain connectivity--Professional judgment assumes that floodplain connectivity is at risk in Clear, Bear1, Fall, and Austin/McKnight subwatersheds. Lower Nestucca, Lower Three Rivers, and Alder/Buck are not properly functioning. By implementation of actions similar to those included in the Proposed Action throughout the watersheds, the trend is improvement of this condition on NFS land over time.

Analysis of Direct and Indirect Effects

The effects of the proposed actions on aquatics are a significant issue, (Chapter 1, page 1-13), Issue 1). Commercial thinning and road management could degrade the existing water quality by increasing sedimentation. Ground skidding and decking of logs with heavy equipment has the potential to cause erosion by exposing soil and reducing vegetative cover. Two factors, road densities and sedimentation, are used to define the effects of the proposed alternatives.

Roads may affect aquatics in two ways: First, sediment that may be generated by decommissioning roads. Second, sediment may come from roads that are not properly maintained. The more miles of open road, the greater the risk of sedimentation and cost to maintain them. Conversely, decommissioning roads would reduce the risk of sedimentation in the long term.

Alternative 1 No Action

Road Densities--Very little change in the short term. However, as roads become unusable, due to instability and brush growth, it is anticipated that the number of road miles would decrease in the watersheds.

Sedimentation--The amount of sediment that may reach streams should average about the same. There may periods where there is more sediment if the vulnerable roads fail and maintenance is not performed at the level needed because of the lack of funding to do the needed maintenance. As some roads brush in and become impassible by standard vehicles, some reduction in sediment rates is anticipated over the long term.

Action Alternatives

The effects of the three evaluated action alternatives are summarized below. The differences are considered slight, but where they occur they are described.

Thinning Effects—Action Alternatives

Commercial thinning would be done in all three alternatives, so their effects would be the same.

Table 3-3: Harvest Unit Characteristics Relative to Coho Habitat, Perennial and Intermittent Streams and Sub-Watershed Location

		Stream Types Within or Adjacent to Units		
Unit	Closest Distance to Coho Habitat (miles)	Perennial	Intermittent	Sub-watershed Name
1	0.83	Yes	Yes	L. Nestucca & L. 3 Rivers
2	No Streams	No	No	Clear
3	No Streams	No	No	Lower 3 Rivers
4	0.13	No	Yes	Clear
5	2.17	Yes	Yes	Clear
6	0.56	Yes	Yes	Clear & Fall
7	2.20	Yes	Yes	Bear1 & Alder/Buck
8	1.20	Yes	Yes	Bear1
9	0.16	Yes	Yes	Fall
10	1.40	Yes	Yes	Fall
11	3.09	Yes	Yes	Fall
12	1.05	Yes	Yes	Fall
13	1.30	Yes	Yes	Fall
14	0.91	Yes	Yes	Fall
15	0.44	Yes	Yes	Bear1
18	No Streams	No	No	Bear1
19	0.47	Yes	Yes	Austin/McKnight
20	0.30	Yes	Yes	Austin/McKnight

Plantation thinning would accelerate the development of large diameter conifers in riparian areas that eventually would become large woody debris. The quadratic mean diameter of existing conifers averages 12.8 inches, whereas the residual diameter after thinning is estimated to be 15.5 inches. Thinning is expected to develop 24 inch and larger diameter trees 50 to 60 years sooner than similar stands that are not being thinned. Plantation thinning would maintain 3 to 8 times the density of conifers as is found in the overstory of mature natural stands, based on thinning unit projections and natural stand data on the Siuslaw National Forest.

Pabst and Spies (1999) found that average basal area of conifer trees in natural stands in western Oregon is lowest near streams and gradually increases with distance from the stream for the first 100 feet. The relatively small diameter of existing conifers, high density of conifers being maintained within thinning units, with no harvest buffers, and naturally low abundance of conifers in riparian areas would maintain large woody debris growth and input potential. Harvest of some trees within 100 feet of streams is expected to have negligible effects on coho and their habitat based on the rationale above. In the long term, large woody debris would increase more rapidly after thinning thus, increasing the potential for restoration of large woody debris to stream channels on the Gauldy Project Area.

Monitoring of several completed thinning units on the Siuslaw National Forest have found that harvest buffers are very effective at preventing sediment from reaching stream channels. No evidence of surface or slope failure erosion from thinning activities has been observed to reach any stream channel. No slope failures have been observed in thinning units. The only surface erosion observed has been on a very few short (few feet) sections of yarding corridors that are on steep slopes without vegetation or woody debris. Due to post harvest erosion control and corridor layout, the observed surface occurred only during heavy winter storms, and only moved the exposed soil less than three feet. Typically, within a few feet of the erosion area woody debris or vegetation creates a deposition area where all sediment is deposited. Some minor increases in sediment production have been observed when a tree is accidentally felled into a no harvest buffer and stream channel. Introduced sediment from these rare accidents is limited by leaving the tree where it fell.

Road Effects-Action Alternatives

The elements of the significant issue discussed in Chapter 2 include the miles of open roads and their effects. In all action alternatives road mileage decreases and maintenance improves. Road decommissioning would remove barriers (culverts and fills) to wood transport (individually and in debris torrents) so that wood can accumulate in historic locations and can be transported downstream at natural rates. Thus, long-term effects of the project are expected to reduce road impacts to aquatic resources, continuing the trend of habitat restoration.

Increases in turbidity with road decommissioning and road maintenance are expected to be small, short lived and limited in geographic extent. Culvert removals are expected to increase turbidity for only a few minutes, while they eliminate the risk of culvert and fill failures, which can have serious downstream impacts over an extended geographic area, if the fills are deep. All actions would be implemented during low stream flow, which would limit the geographic extent of the effects. Turbidity increases at the source of the action would quickly decrease downstream as fine sediment and organics settle out and are diluted by the addition of clear streams (tributaries and mainstems). More than 95% of fill volume at each culvert is typically removed without any increase in turbidity during road decommissioning. Turbidity increases usually only occur when culverts are actually installed or removed, or when the channel is diverted to minimize turbidity and sedimentation downstream. Monitoring observations of past culvert installation and removal activities on the Siuslaw National Forest have found that turbidity increases are infrequent, of short duration and quickly dissipate downstream.

Monitoring of several road decommissioning projects on the Siuslaw National Forest have found that very little sediment is eroded downstream when design criteria are followed. Covering raw banks adjacent to the channel with brush substantially limits erosion and provides roughness for deposition during the first winter. Within one year, about 80% of bare soil areas adjacent to streams have become vegetated. Most of the sediment transported downstream following road decommissioning originates from the sediment plain that often forms just upstream of culverts. Where large sediment plains exist, brush and logs are placed into the channel to help stabilize the sediment plain.

Monitoring found that when fill removals are not wide enough erosion can occur as the channel reclaims its bankfull and valley width. Erosion of the remaining fill, fill that should have been removed according to design criteria, only occurs during high flows but may occur for several years. The amount of sediment eroded is quite variable ranging from none to a few cubic yards per year. Erosion at these sites has been observed to decrease with time as the site becomes vegetated.

Threatened and Endangered Fish Species

Threatened and Endangered species, and those species proposed for listing, are managed under the authority of the Endangered Species Act and National Forest Management Act (NFMA). They are species designated by the National Oceanic and Atmospheric Administration (NOAA) Fisheries because they are in danger of becoming extinct throughout all or part of their range, or are likely to become so in the near future.

Table 3-4 shows the status of the one Threatened species that is known or suspected to occur on the Forest and its status in the Gauldy Project Area. No Endangered fish are known or suspected to occur in the Gauldy Project Area.

Table 3-4: Threatened and Endangered Fish Species

Status	Species	Forest Status*	Gauldy Project Area Status
Threatened	Oregon Coast coho salmon	Known	Suspected

An estimate of stream crossings on the haul route is tabulated by sub-watershed in Table 3-5. The only crossing of coho habitat occurs at the Forest Road 1500 bridge on Three Rivers that is paved for at least two hundred feet on either side of the bridge.

Table 3-5: Estimated Number of Perennial and Intermittent Stream Crossings on the Haul Route by Sub-Watershed

7th Field Sub-watershed	Perennial Crossings	Intermittent Crossings	Total Crossings
Lower Nestucca	1	2	3
Lower Three Rivers	1	4	5
Alder/Buck	0	0	0
Fall	2	8	10
Clear	2	5	7
Austin/McKnight	1	2	3
Bear1	1	12	13
Total	8	33	41

Only two culverts (Units 1 and 9) need to be installed in perennial streams prior to haul. Several channel culverts (intermittent and perennial) would be removed with road decommissioning. Culvert installation and removal activities are expected to produce short-term increases in turbidity (only in perennial streams) near the activity, with turbidity quickly decreasing as distance from the activity increases. To minimize the risk of these brief turbidity increases reaching coho habitat, design criteria has been included that requires installation of a minimum of two temporary dams (local vegetation, straw bales, silt fences, etc.) in depositional areas prior to culvert installation and decommissioning.

Since the culvert in Unit 9 is the closest perennial stream to coho habitat (0.45 miles), it was analyzed intensively to assess the effects of culvert installation and removal. Field surveys of the channel between the Unit 9 culvert site and coho habitat found that the channel has a moderate gradient and two large waterfalls about fifty and fifteen feet respectively. The stream contains several low-gradient deposition reaches, log jams, and abundant small woody debris where most of the fine sediment (turbidity) is expected to deposit before reaching coho habitat. The temporary dams would increase the likelihood that turbidity would not reach coho habitat, even though existing channel characteristics and distance make this unlikely anyway. The only other required culvert replacement prior to harvest is located in Unit 1 and is 0.95 miles from coho habitat and perhaps further from coho habitat if the Highway 101 culvert is a complete barrier as it appears.

Small streams have been shown to be very retentive of introduced fine sediment. Duncan et al. (1987) found that less than 45% percent of introduced fine sediment (<2mm) into two separate channels made it four hundred seven feet downstream, even during high winter flows (65 to 70% of bank full flow). At low flows, similar to those expected at the Unit 9 culvert when it is installed or removed (<0.1 cfs, based on Siuslaw NF data of drainage area and flow relationships), they found almost no fine sediment was transported more than 400 feet. They found that fine sediment transport was reduced as the abundance of woody debris increased and stream gradient decreased. Considering the Unit 9 culvert is approximately 2,400 ft from coho habitat (six times longer than the study streams in Duncan et al. (1987), its average gradient is about half their study streams (12% vs. 22-31%), and the design criteria to add woody debris dams to increase retention, turbidity in coho habitat is expected to be minimal. In the long term, turbidity would be reduced after road decommissioning removes the risk of erosion at the road fills.

All other road-decommissioning culverts on perennial streams, except Forest Road 1589 culvert on Fall Creek, are expected to have similar or lesser effects as that outlined for Unit 9 considering they all have smaller drainage areas (less flow) and are further from coho habitat (0.6 to 2.4 miles). This culvert has plugged and eroded a significant portion of the road into the stream channel and should be removed as soon as possible to reduce sedimentation downstream.

The culvert removal on Forest Road 1589 has a drainage area that is about two times larger than the Unit 9 culvert, but it is thirty five percent further (0.7 miles) from coho habitat. Flow at this site during decommissioning is expected to be <0.2 cfs. At this flow, Duncan et al. (1987) estimated that less than ten percent of the delivered sediment traveled more than four hundred feet. Considering this culvert is approximately 3,700 feet from coho habitat approximately nine times longer than the study streams in Duncan et al. (1987), its average gradient is less than half their study stream's (11% vs. 22 to 31%), and the design criteria to add woody debris dams to increase retention, turbidity increase in coho habitat is expected to be minimal.

Although no increase in turbidity is expected in coho habitat from the proposed actions, studies of juvenile coho salmon response to turbidity indicate that minor, short-term increases do not alter fish behavior. Bisson and Bilby (1982) found that juvenile coho salmon acclimated to clear water (<0.3 NTU) and turbid water (2 to 15 NTU) did not exhibit significant sediment avoidance until turbidity reached 70 and 100 NTU, respectively. Similarly, Berg and Northcote (1985) found that a gradual increase in suspended sediment to produce a turbidity of 20 NTU did not alter behavior of coho salmon juveniles in laboratory streams.

The following summarizes the analysis of effects on this species.

Oregon Coast coho salmon (*Onchorhynchus kisutch*)

Alternative 1 No Action--Would have [4]**No Effect** on Oregon Coast coho salmon or their habitat. This determination is based on: 1) no further harvest would occur as a result of this alternative, and 2) other management activities (i.e. road maintenance, planting, thinning, etc.) have been screened on a project-basis and have been found to have no effect on Oregon Coast coho salmon. Potential culvert and fill failures cannot be accurately determined. Thus, they are not considered in making this determination.

Alternatives 2--May Affect, but are not Likely to Adversely Affect Oregon Coast coho salmon. This determination is based on: 1) the proposed action alternatives having immeasurably low impacts to aquatic systems within the Gauldy Project Area, and 2) road decommissioning would decrease road-related sediment over time and 3) following the Forest Plan standards and guidelines and Best Management Practices should minimize the effects of management activities on aquatic systems.

Sensitive Fish Species

Sensitive species are those species for which population viability is a concern due to significant declining population numbers, density, distribution, or habitat capability. They are managed under the authority of the National Forest Management Act (PL 94-5888), and are administratively designated by the Regional Forester.

[4] The following effects***, May Affect—Likely to Adversely,*** etc. These determinations are a result of the Endangered Species Act consultation process and are relative terms used to determine the effect on these species.

Sensitive fish species that are known or suspected to occur on the Siuslaw National Forest and their status in the Gauldy Project Area are shown in Table 3-6.

Table 3-6: **Sensitive Fish Species and Status**

Species	Forest Status*	Gauldy Project Area Status*
Oregon Coast steelhead	Known	Suspected
Oregon Coast cutthroat trout	Known	Suspected

*Known: Known to occur based on surveys or other evidence

*Suspected: Suspected to occur because suitable habitat exists and because area is within range of occurrence.

Oregon Coast steelhead and cutthroat trout

Alternative 1 No Action--Would have **No Effect** on these species. This determination is based on: 1) no further timber harvest would occur as a result of this alternative, and 2) other management activities (i.e. road maintenance, planting, thinning, etc.) are low impact and improve watershed conditions over time.

Alternatives 2 Proposed Action--This Alternative **May Effect, not Likely to Adversely Affect**. This determination is based on: 1) the proposed action and its alternatives having immeasurably low impacts to aquatic systems within the Gauldy Project Area, and 2) the proposed road decommissioning activities effects would be minimal and temporary.

Watershed/Fisheries-Cumulative Effects

The cumulative effects on the aquatic resources in the Effects Area are a combination of the management actions that occur on private, State, and NFS land and natural occurrences. The trend for management actions on NFS land is to improve the aquatic conditions. In the Effects Area, approximately thirty one miles of road have been decommissioned. This trend is expected to continue. 1,400 acres have been commercially thinned with the goals of increasing tree growth and vigor, and over all stand health. This trend is expected to continue. About 45 acres of riparian habitat improvement projects in 5 stream reaches have been done to improve stream temperatures and develop large conifer trees that can provide large wood in the future. This trend is expected to continue.

Private Land Development--The private land in the Effects Area is closer to the major rivers and streams that flow through it. Activities associated with continued development of private land for residences, timber production and farming may result in both long-term and permanent effects to aquatic resources, including sedimentation, and reduction and maintenance of vegetation in such a manner that high stream temperatures may remain. At the same time some riparian and in-stream improvement projects have been performed, are on-going, and are expected to continue. The type and timing of these activities is not known, so it is difficult to determine what the exact effects may be.

State Land--The Oregon State land in the Effects Area is managed by a series of rules and regulations whose goals are protect and enhance aquatic and watershed resources. This trend is expected to continue.

Other Activities on National Forest System Land--Other foreseeable actions include noxious weed control, road maintenance, administrative road use, public recreational use, and small forest products gathering for personal use. Experience indicates that by following best management practices designed for these actions, they have very little effect on aquatic resources

Recreation

Introduction

For discussion purposes, recreation is divided into three categories: **Developed, Dispersed and Wilderness/Roadless**. Developed recreation examples are campgrounds, trails and trailheads, ski areas etc. Dispersed recreation includes those numerous activities that occur outside developed recreation sites. Examples are camping outside developed campgrounds, sightseeing, rock climbing, hunting, fishing, gathering special forest products etc. Wilderness areas are areas set aside by Congressional action. These areas are typically large primitive areas with limited access. Dispersed recreation activities can occur in these areas. Most do not have developed facilities within them. Roadless Areas may contain wilderness characteristics, but have not been officially designated by Congress. Typically, they are a Management Area in Forest Plans. The Forest Plan determines whether these areas should be recommended for wilderness designation. In the Gauldy Project Area there are no developed recreation sites, Wilderness or Roadless Areas. The characteristics of the project area were reviewed during the various Roadless Area reviews and determined not to have the characteristics of Roadless Areas. No developed recreation sites are planned for this Area.

Existing Condition and Trends

Paved state and county roads border the Gauldy Project Area on all sides. This plus the relatively good condition of Forest Road 15 that travels north and south through the Area, makes the Area relatively easy to access. There are several small communities with twenty miles of the Gauldy Project Area; these include Beaver, Cloverdale, Hebo, Neskowin, and Pacific City.

The factors that affect recreational use in the area are weather, condition of roads, and the type of activity. Presently, the existing open road system makes about forty percent of the area accessible. This estimate assumes that most activities are restricted to within an average of 200 feet of the roads, due to the steep, brushy terrain that limits cross-country or off road travel.

Most of the roads used to access the area are located on NFS land. The roads located on the private land that surround the area have limited public access, as many of these are closed or are short segments typically accessing landings used when the private lands were logged and tend to be located in the lower elevations of the area. They generally do not reach NFS land.

The amount of use and quality of the recreation experience is difficult to quantify, because of the variety uses that occur. However, several patterns are evident:

A. Most of the use occurs during the summer and fall months. Dispersed camping occurs on or along the roads. The permanent or regularly used areas are along the Forest Roads 1500 and 1533, due to their travelway fair condition. Most occurs in the two large open areas formed from gravel pits developed when the 1500 Road was constructed and maintained. Other dispersed camping occurs, typically, on the existing landings developed when the stands were clearcut. Castle Rock Wayside, off of Highway 22 near Three Rivers provides dispersed overnight camping.

B. The project area is important for the citizens of Cloverdale and Hebo, as portions of the project area are within 10 minutes of these communities. The use of the project area may be considered "local" in the sense that most of the use is by those who know the area. Because there are no destination points, i.e. a campground, trailhead etc., the area does not receive a lot of "outside use", except during hunting seasons.

C. The conditions, maintenance and location of the roads greatly influences dispersed recreational use:

The roads in the young managed stands do not see much use due to the presence of brush that reduces the width of the travelway. As the trees grow these travelways reopen and see more use. Roads that have a rocked surface tend to stay open longer as the trees form a bridge over the road and shade out the surface vegetation. Those roads without rock tend to grow shut.

The condition (maintenance level) is important also. Those roads in Maintenance Levels 2 and 3 allow a variety of vehicles to use them. The 1500 Road for example is in good enough condition for passage by trucks towing trailers, and cars. The Maintenance Level 2 and those Maintenance Level 1 roads that are not closed are, generally, only passable by two and 4-wheel drive high clearance vehicles. ATVs and motorcycles can use most of the open roads in the area.

The extensive road system and its condition provide the opportunity for people to find some solitude.

Climate and terrain influence the conditions of the roads in the Area. Due to high amounts of the rainfall, steep slopes with unstable soils, requirements to protect aquatic and wildlife resources and rapid growth of vegetation the roads need regular maintenance.

D. The demand for recreational opportunities is expected to increase an estimated 1-2% per year on the Siuslaw National Forest. Exactly how much this affects the Gauldy Project Area is not quantifiable.

Analysis of Direct and Indirect Effects

Public access to the project area is a significant issue (Chapter 1, page 1-14 Issue 2). Two comments received during scoping from individuals living near the area recommended that none of the roads be closed. The concern is that decommissioning the Forest Roads would reduce the opportunity for motorized access to hunting areas, and recreation, particularly for those that live near the area and have used it for a number of years. Using the project area is considered important to their culture and families.

Alternative 1 No Action

In this alternative, roads would be maintained as available funds allow. It is expected that some of the roads would close due to rapid vegetation growth and slope instability. As roads become closed some recreational opportunities would be reduced. Exactly how much is not quantifiable because it is impossible to determine which roads would close or to what extent, and what influence this would have.

Alternative 2 Proposed Action

This alternative closes about half of the Forest Roads in the area. They would be closed to most vehicles. It is anticipated that some could be used by ATVs. There would be open Forest Roads throughout the Gauldy Project Area that would allow dispersed activities to take place through out the area, which is preferred. This would also provide an opportunity for solitude. If the open Forest Roads in the project area receive better maintenance, some of dispersed camping occurring along Forest Road 1500 may move else where. This has both positive and negative effects. One positive is spreading out the use may increase dispersed recreation opportunities. The problems with dispersed camping, (i.e. garbage and sanitation) may occur in these new areas.

Alternative 3 Private Land Access

The effects of this alternative are about the same as the Proposed Action. Although about ***2*** miles of road would not be decommissioned, they would be closed to most vehicles. It is anticipated that some could be used by ATVs.

Alternative 4 Minimal Road System

This alternative decommissions all roads in the Area, except Forest Roads 1500 and 1533 and the roads that access private land. This alternative is the least desirable. The exact effects are difficult to qualify. However, the following trends are expected:

- Opportunities for dispersed camping and other activities are greatly reduced.
- Garbage and sanitation would increase at the existing areas on Forest Road 1500.
- ATV use may increase, if the roads are not closed to this type of vehicle.
- Road closures would concentrate use on two Forest Roads. This may reduce opportunities for hunting and finding solitude, as these activities, typically, require space between users.

Recreation--Cumulative Effects

The trend is for less open Forest Roads for public use both in the Gauldy Project Area and on the Siuslaw National Forest. How this would affect dispersed recreation is difficult to quantify due to the variety of factors that affect this resource. Designating some of the proposed decommission roads as ATV trails may reduce these effects.

Vegetation

Introduction

The forests in the Gauldy Project Area are composed of a variety of vegetation. This vegetation occurs in diverse combinations and patterns of species, ages, sizes, shapes, and structure. These diverse forests provide a multitude of social, biological and ecological benefits, such as wildlife habitat, timber products, firewood, mushrooms, berries, clean air and water, and a pleasing setting for human enjoyment. Disturbance processes play a major role in shaping forest vegetative conditions. A through description of the vegetation is included in the Nestucca and Little Nestucca Watershed Analyses, and the LSRA

Existing Condition and Trends

No significant issue was identified during scoping about whether to thin these stands or not. There was one comment about how the proposed thinning should be done to increase variability within the stands. This comment is discussed in the Alternatives Considered but Not Fully Evaluated Section, Chapter 2, page 2-20. The following discussion focuses on the condition of the young managed conifer stands in the Gauldy Project Area, since they would be directly affected by the proposed actions.

Since the 1940's the results of intensive timber management is a decrease in mature conifer distribution and patch size and an increase in young conifer. Table 3-7 lists the stand acres by age on NFS Land in the Gauldy Project Area. Clearcuts in the 17 to 45- year olds classes were usually planted with 300 to 700 Douglas-fir seedlings per acre to maximize growth, and then managed through a series of treatments for timber production. Clearcuts 16 years old and younger were commonly planted with a mix of conifer species and some with alder. The goal and trend is to develop large blocks of mature conifer, as identified in the LSRA.

Table 3-7: Acres of Stands Currently in Various Age Classes

Managed and Natural Stands	
Stand Ages	Acres
16 and younger	1,847
17-29	1,398
30-45	1,790
Subtotal Managed	5,035
Natural Stands	7,625
TOTAL	12,660

Existing Condition-Young Managed Conifer Stands

30 to 45 year old stands

The 30 to 45 year old managed stands are even-aged and single canopied (the crowns are all about the same height). The current average stocking levels of these stands vary from 183 to 365 trees per acre. The trees are tall and thin, have relatively uniform bole diameters, and have few branches over one inch in diameter. These stands, typically, have 85% to 90% percent crown closure, so little light reaches the ground, or lower tree branches. Thus, there are few shrubs, forbs or grasses on the forest floor. Without some type of management, these stands would stay in this condition for a lengthy period.

Due to lower growth rates and crowded conditions, these stands are more susceptible to damage from insects or wind than stands with less stems per acre. These crowded conditions increase the probability that an entire stand or stands could be lost in a single disturbance event. Examination of other stands in the area indicates that wind is the most significant disturbance agent. Sustained high winds during the wet season can cause significant damage to these structurally weak stands. Due to the fragmented amount of late-successional habitat in the project area, and the fact that these stands are needed to fill in the gaps, there is need to protect, as much as possible, these young aged stands from disturbance events.

Most of the stands are dominated by Douglas-fir. The western stands in the project area have some western hemlock mixed with the Douglas-fir and those at lower elevations or on higher elevations north facing slopes generally contain some Sitka spruce.

Swiss needle cast is present in those stands dominated by Douglas-fir. Swiss needle cast causes the growth of trees to slow down and may increase the risk of mortality. There is a need to change the species mix in those stands dominated by Douglas-fir, increasing stand variability to prevent diseases from destroying monoculture stands and provide shade tolerant species structure as the stands. Laminated root rot present in some stands is at such a low levels that there would be no appreciable affect on stand development.

Considering down coarse woody debris (CWD), which is larger than 12 inches in diameter, the proposed units currently contain an average down woody debris loading level that ranges from 689 to 8,807 cubic feet per acre. Most of this down wood is in the older decay classes. The numbers of snags within the treatment units that are larger than 7" DBH range from zero to twenty three per acre; the average sizes of these snags range from 7.5 to 11 inches DBH. In terms of what would be expected naturally, 16 to 18 proposed treatment units are within the high range of coarse wood loading as described within the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*. Based upon the differences in how the CWD data was gathered for the treated stands from that within the LSRA, the remaining two proposed treatment units are probably most accurately within at least the moderate, if not also the high range of coarse wood loading. However, to insure that sufficient snags are present there is a need to create about up to three snags per acre in units 8 and 18.

In their current condition, the young managed stands will not develop late-successional habitat characteristics in the near future. Recent research (Carey, 2002; Franklin, 2001; Garman, 2003; Hunter, 2001; Muir, 2002; Tappeiner, 1997; and Thysell, 2001) shows that thinning can improve the probability that these stands will develop late-successional forest characteristics within the next 100 years. How quickly these stands develop these characteristics depends on how heavily these stands are thinned at each entry.

For the young managed stands the specific desired condition, over time, is one in which the treated stands have an increased overall mean diameter, increased rate of tree diameter growth and crown development (including large limbs low in the crown and broken tops), stimulated understory shrub and herb development, diverse species composition, increased development of a shade tolerant understory, increased snags and down wood levels in all stages of decomposition, greater windfirmness, and developed trees that could become future sources of high-quality snags and/or down wood.

29 years and younger stands

Stands in this age class are also even-aged and single canopied. Older stands are commonly dominated by Douglas-fir while younger stands often contain a mix of species, including western hemlock, Douglas-fir, western red cedar, red alder, and Sitka spruce, where appropriate. Young stands less than 15 years old and stands that have been recently thinned often have open canopies. Light penetrating through the canopy stimulates heavy growth of shrubs such as salmonberry and red huckleberry.

The only disease common in these stands is Swiss needle cast and its impact on the Douglas-firs. Many of the older stands have noticeable levels of bear damage to the Douglas-firs and porcupine damage to the western hemlocks, both of which are often mistakenly reported by forest visitors as insect or disease problems in the Gauldy Project Area.

Because of their age, these stands generally have few snags other than the short, old, heavily decayed snags left from the last large-scale fires. Levels of coarse woody debris (CWD) vary widely in these stands based on the amount and intensity of site preparation burning that occurred in the stand after clearcutting. Younger stands generally were not burned and contain high levels of CWD in all stages of decay. Older stands in this age class generally were burned. The more intensely burned sites have low levels of CWD, mostly in the later stages of decay. While lightly burned sites have moderate to high levels of CWD distributed throughout the decay classes.

In general, trees in this age class are growing rapidly, both in height and diameter. Crowns are closing rapidly and, if not precommercially thinned, would rapidly crowd out all shrub, herb, and grass under-growth by the time that the stand is thirty years old. As the crowns close and light can no longer reach the limbs that are lower in the canopy, the lower limbs begin to die and the portions of the remaining live crown "move" higher into the canopy.

These stands are too young for commercial thinning, but may be precommercially thinned to enhance characteristics as identified in the LSRA.

Analysis of Direct and Indirect Effects

No Action Alternative

No stand treatments would be done at this time. There is no direct effect on the stands. The indirect effects are the delayed development of late-successional characteristics, potential adverse effects of soil displacement on steep slopes in closed canopy stands, delayed or no development of sources of large coarse woody debris for streams, and increased potential for stand-replacement events.

Action Alternatives

The differences between the action alternatives concern road management. The treatment of the young stands is same in all action alternatives. Thinning would result in increased diameter growth, crown development, and understory diversity. Thinning is not known to spread Swiss needle cast or increase the rate of infection in the tree, but Swiss needle cast increases the initial stress of thinning. A moderate thinning would help minimize this effect. Postponing thinning these of stands would make them even more susceptible to thinning shock, blowdown, etc. in the future.

The harvest of trees would result in the loss of potential CWD and snags. It is anticipated that some of this loss would be made up by mortality that may occur due to natural processes and logging damage. Logging damage would be minimized by operating outside of the period when bark slippage is likely to occur and by following logging practices such as falling to lead and maintaining narrow yarding corridors. However, some (not more than ten percent) damage is expected to occur and damaged trees would not be removed from the harvest unit. Leave areas within units and untreated portions of stands containing harvest units would ensure a gradual input of small trees dying from competition. Part of the purpose of the project is to increase tree growth so that larger trees would be available as snags and down wood sooner than if left unthinned.

Those alternatives that decommission a substantial miles of road may preclude treatment of these stands for two reasons: 1) There is a risk that road access to these stands may not be restored, because the present opinion of NOAA Fisheries is replacing culverts may have an adverse impact on T&E fish species. At the present time due to litigation, the NOAA Fisheries is not completing Biological Opinions (BO) for those commercial thinning project that may have an adverse affect. Without a BO, a project cannot be done on NFS land. 2) Aerial logging of these stands is not economical. The amount of volume produced from these stands would not pay for the work needed to thin these stands.

Not treating these stands for 10 to 15 years may make the treatments inappropriate, because of the increased risk of blowdown. Additionally, recent studies conclude that the large overstory trees found in old-growth stands never went through periods of reduced growth due to competition, so the opportunity for enhancing most late-successional characteristics would be missed.

Vegetation-Cumulative Effects

The existing condition discussion describes the cumulative effects of the past actions. The Forest Plan has changed the goals for the Gauldy Project Area. The goal now of the proposed thinnings and riparian planting is the maintenance and acceleration of the development of late-successional habitat. Discussion of the cumulative effects then is what has been accomplished to meet this goal, and the effects of the alternatives.

No Action Alternative

It is difficult to quantify what the cumulative effect of not treating the stands would be. It is anticipated that some of the stands would develop some late-succession characteristics in the long term. However, recent research seems to indicate that most would not or, at least would take a very long time to develop the desired conditions. This does not meet the goal of the Forest Plan. This alternative also does not meet the underlying need of providing forest products to communities.

Action Alternatives

About 905 acres of the stands that are sixteen years and younger have been precommercially thinned in the Gauldy Project Area. It is expected that the remaining 942 acres would be done in the next three to five years. Approximately one third of the 17 to 45 year olds were precommercially thinned when they were 10 to 15 years old. None of the approximately 3,000 acres of this age class have been commercially thinned. The proposed action would thin about 850 acres. These thinnings are the first entries into these stands. It may take several thinnings before these stands are on a trajectory to reach the desired condition.

Non-Federal Land

Thinning occurs often on State and private industrial timberlands in the Gauldy Project Area. Some private, non-industrial landowners conduct thinning operations. However, most non-federal lands are managed primarily for clearcutting and planting. Timing of these harvests is difficult to predict due to market fluctuations and landowner/manager financial concerns.

Based on past practices and recent conservations with landowners in the Gauldy Project Area, it is likely that ten to 15% of the non-federal timberland would be clearcut per decade and 3 to 7% would be commercially thinned.

Wildlife

Introduction

The inclusion of the marbled murrelet and the northern spotted owl in the Endangered Species Act (ESA) resulted in the major amendment of the Forest Plan. Under this amendment, the management of the conifer stands on NFS land went from timber production to the development and maintenance of late-successional habitat. This habitat is necessary for the survival of these species.

The Wildlife Resources section addresses the significant issues and concerns discussed in Chapter 1, page 1-15 Issue 4. The Wildlife section of this chapter is organized to address this issue. The Gauldy Project Biological Evaluation, located in the Appendix, contains further information or additional analysis conducted for other wildlife species or habitats that were not identified as issues or concerns but may be found in the Gauldy Project Area, including Management Indicator species, Survey and Manage, and neo-tropical migratory birds (land birds). The effects to these species summarized also in Table 3-11-Alternative Summary of Effects located at the end of this chapter.

Existing Condition and Trends

Threatened and Endangered Species

Table 3-8: Estimated Acres of Spotted Owl, Marbled Murrelet, and Bald Eagle Suitable Habitat within the Gauldy Project Area

Habitat Classification	Acres on Siuslaw National Forest (% of Federal Land within Project Area*)	Non-Federal Acres including State or Private **	Total Acres (% of Total Project Area*)
"Non-Habitat" (approximately 0- to 30-years-old)	3301 (26%)	4,740 (~72% agricultural, 28% plantations)	8,041 (39%)
Spotted Owl Dispersal Habitat (stands approximately 31- to 75-years-old)	5,065 (40%)	2,500	7,565 (37%)
Spotted Owl and Marbled Murrelet Suitable Habitat - (stands greater than approximately 76-years-old)	4,339 (34%)	400	4,739 (23%)
Bald Eagle Suitable Habitat	734 (31%)	300	1,034 (14%)
Total Acres within Project Area*	12,705	7,663	20,391
Total Acres within eagle Project Area*	2,364	4,932	7,296

*The Gauldy Project Area includes lands located east of US Highway 101, west of Highway SR22, and north of Highway SR130 (the Little Nestucca Highway). In the case of the bald eagle, the Gauldy Project Area includes only those acres within one mile of a large major river or lake, or 0.5 mile of major tributary and located east of US Highway101, and west of Highway SR22, and north of Highway SR130.

**Some of the data on non-federal land is about 20-years-old; the "Non-Habitat" classification is expected to comprise a larger percentage of the non-federal land than is displayed on this table as a result of harvest activities within older timber types.

The bulk of the mid- to late-seral stage habitat within the Gauldy Project Area is located on federal land (see Table 3-8). In addition, the majority of these federal lands are being managed for the development and maintenance of habitat for late-seral stage species such as the spotted owl and marbled murrelet. Currently approximately 74% percent of the federal land within the Gauldy Project Area is in a condition to function as dispersal or suitable owl habitat; 38% of the non-federal land is in a condition to function as dispersal or suitable owl habitat, with the vast majority being of a condition to function only as dispersal habitat.

Marbled Murrelet

Introduction

Murrelets use older forests stands generally within 50 miles of the coast for nesting. More commonly, murrelets occupy old-growth forest compared to mixed-age and young forests in California, Oregon and Washington. Suitable habitat includes contiguous forests areas with conditions that support nesting murrelets. These forests are generally characterized by large trees greater than 32 inches in diameter at breast height (DBH), a multistoried stand and a moderate canopy closure. Individual tree attributes that provide conditions suitable for nesting include branches large enough to provide a platform for nesting located high above the ground. Nests also tend to have a high degree of canopy closure over them. Nest trees may be scattered or clumped throughout the nest stand.

Activities occurring in or around suitable habitat may also affect murrelets via disturbance, which may interfere with essential nesting behaviors during the murrelets' breeding period (April 1 to September 15, with the critical nesting period being April 1 to August 5). Although there is little detailed information concerning the vulnerability of murrelets to disturbance effects, research on a variety of other bird species suggest that such effects are possible. Such studies have shown that disturbance can affect productivity in a number of ways: nest abandonment, egg and hatchling mortality due to exposure and predation, longer periods of incubation and premature fledging or nest evacuation. Preliminary results of a study involving artificial murrelet nests have suggested that proximity to humans has an effect on nest predation, with stand structure as the strongest effect and landscape contiguity as another intermediate effect. Based on preliminary results of effects of disturbance, it should assumed that any amount of disturbance could result in impact to this species, although it is expected that these negative impacts are on a much lesser scale than the impacts due to the loss of occupied habitat.

Most population estimates for murrelets have been conducted using at-sea surveys and are subject to many sources of error, such as the methods of counting flying birds, environmental conditions, and observer ability. These sources of error may also change with the season and location of the surveys.

Beissinger (1995) constructed a demographic model of the murrelet and concluded that the population in Oregon may be declining at a rate of 4% to6% per year, but this estimate is hampered by the possibility that the age-ratio used in the model are reflective of a relatively temporary decline due to unusual ocean conditions (*Ralph et. Al. 1995).* Similarly, Strong and Catren (2000) also suggested that there may be a decline in the Central Oregon population, which constitutes the majority of murrelets in Oregon. Both Ralph *et al.* and the Marbled Murrelet Recovery Team (USFWS 1997) have concluded that the listed population appears in a long-term, downward trend. The decline of the murrelets is linked to the removal and degradation of available suitable habitat. The trend for development of suitable habitat is expected to improve over time.

Murrelet Critical Habitat

Designation of critical habitat serves to identify lands that may be necessary for the conservation and recovery of listed species. On May 24, 1996, the United States Fish and Wildlife Service published the final rule designating murrelet critical habitat in the Federal Register effective June 24, 1996. This habitat encompasses about 3.9 million acres across Washington, Oregon and California. The primary objective of critical habitat is to identify existing murrelet habitat and highlight specific areas where management should be given highest priority. Critical habitat is primarily based on the Late-Successional Reserves (LSRs), which were designed to respond to the problems of fragmentation of suitable habitat, potential increases in predation due to fragmentation, and reduced reproductive success of murrelets in fragmented habitat.

Existing Condition

Table 3-8 displays the quantity of murrelet habitat within the Gauldy Project Area. Approximately thirty four percent (4,339 acres) of the federal land within the project area is currently considered to be marbled murrelet suitable habitat. Considering all ownerships, approximately 23% (4,739 acres) of the land within the Gauldy Project Area is currently considered to be the marbled murrelet suitable habitat.

Much of the suitable habitat is within a band approximately 2 to 8 miles from the ocean within the Gauldy Project Area. It is considered to be of a relatively high quality, because many of the 80- to 110 year-old stands are composed of large Sitka spruce, western hemlock and Douglas fir, with an uncommon old-growth Douglas-fir component. Often these old stands have relatively sparse or ‘clumpy” conifer stocking, resulting in structurally diverse stands containing large, limby conifers with abundant moss and multiple potentially suitable nesting platforms.

None of the suitable habitat located within the vicinity of the proposed projects has been surveyed to protocol standards as defined by the Inland Survey Protocol for the Marbled Murrelet prepared by the Pacific Seabird Group. However, there have been protocol surveys conducted within the general vicinity of some of the proposed treatment units and/or haul routes within the last decade; these surveys resulted in the identification of several occupied sites. These occupied sites are contained within a large contiguous stand of suitable murrelet habitat approximately 1,000 acres in size, which is located roughly in the center of the Gauldy Project Area. The occupied portions of this stand have not been delineated. Based on the relative high quality of much of the habitat within the Gauldy Project Area and proximity of these stands to the ocean, it would be expected that there are a number of additional unidentified murrelet nest sites within the vicinity of some of the project areas.

Northern spotted owls

Introduction

The northern spotted owl is strongly associated with mature and old growth (late-seral) forests, which provide the structural characteristics required by owls for food, cover, nest sites, and protection from weather and predation. Suitable habitat is defined by the Siuslaw National Forest as stands greater than five acres in size with fifty percent of the canopy comprised of conifers averaging greater than or equal to 18inches in diameter at breast height (Letter of August 24, 1992). The young managed stands proposed for thinning do not meet the definition of suitable habitat. The spotted owl nesting season is March 1 through September 30. The most critical period for fledgling survival ends June 30. There are no spotted owls Reserve Pair Areas (RPAs) within the Gauldy Project Area.

Existing Condition

Table 3-8 displays the amount of owl habitat within the Gauldy Project Area. Including both owl dispersal habitat and suitable habitat, approximately 74% (9,404 acres) of the federal land within the Gauldy Project Area is currently in a condition to facilitate owl dispersal. Considering all ownerships and including both owl dispersal habitat and suitable habitat, approximately 60% (12,304 acres) of the land within the Gauldy Project Area is in a condition to facilitate owl dispersal. Approximately 34% (4,339 acres) of the federal land within the Gauldy Project Area is considered suitable habitat for the spotted owl. Considering all ownerships, approximately 23% (4,739 acres) in the Gauldy Project Area is considered spotted owl suitable habitat. None of this habitat has been surveyed.

There is one known spotted owl site within the Gauldy Project Area. The Salal Point owl site is located approximately one mile from the nearest proposed thinning unit and one mile from the nearest road proposed for stabilization. Despite periodic monitoring by Oregon Department of Forestry and the Pacific Northern Research Station, the last year this site was known to be occupied was 1997 when a single owl residency was established. No RPA was established for this site. Other reported owl sightings as recent as 2001, suggest that spotted owls may be present, at least periodically, in the extreme southern portion of the Gauldy Project Area.

Bald Eagle

Bald eagles generally nest or roost within mature forested stands within one mile of a large major river or lake, or within one half mile of a major tributary. Applying the habitat criteria above and considering the proximity of the Nestucca Bay and larger creeks or rivers, including the lower end of Clear Creek, the mainstems of the Nestucca River, Little Nestucca River and Three Rivers, there are a total of 7,296 acres of land within the Gauldy Project Area which is within the stated distances of the various bodies of water. Approximately thirty two percent of this acreage (2,364 acres) is within the Siuslaw National Forest; approximately thirty one percent (734 acres) of these federal acres are stocked with mature forest (over 18" DBH) and thereby considered suitable bald eagle habitat. Although recent data is lacking, there may be up to an additional three hundred acres of suitable bald eagle habitat within the project area located on non-federal land.
The Salal Point nest is the one known occupied bald eagle nest site within the Gauldy Project Area. It is located on private land approximately two miles from the nearest thinning treatment unit and road segment to be stabilized. There is an additional historic eagle nest site located approximately one half mile from the nearest thinning treatment unit. The bald eagle recovery plan site on the Little Nestucca is not located within the Gauldy Project Area.

Analysis of Direct and Indirect Effects

Alternative 1 No Action

Murrelets and Northern Spotted Owl

There would be no direct effects on marbled murrelets or spotted owls. Development of late-successional characteristics would be delayed, resulting in the absence of nest trees (murrelets and owls) and foraging territory (owls). This is an adverse indirect effect, which may have a direct adverse effect on the populations of these species by reducing their rise in numbers.

Bald Eagle

There would no effect on the bald eagle.

Alternative 2 Proposed Action

Implementation of the proposed commercial thinning would have immediate impacts upon some characteristics of the treated units. The unit's current stocking levels range from 183 to 365 trees per acre. After implementation, stocking levels are expected to range from 86 to 140 trees per acre. Within the treatment units, the current average overstory canopy closure ranges from approximately 85% to 95%; immediately after thinning, it is expected that the average canopy closure would range from approximately 60-to 65% percent. Currently the quadratic mean stand diameter ranges from approximately 10.5 inches to 15.3 inches. Immediately after thinning it is expected that the quadratic mean stand diameter would increase in range from approximately 12.9 inches to 17.8 inches. Currently the average canopy heights range from approximately 70 to 90 feet; because the project would emphasize retaining the dominant trees, the average canopy heights of the treated stands is not expected to be impacted while the average tree height within the stand is expected to increase. Table 3-9 displays some average pre-treatment and expected immediate post-treatment stand characteristics for the individual treatment units within the proposed Gauldy Project. The actual post-treatment retention levels (overstory trees per acre and/or basal area) may vary, due to limitations on the amount of stand examination (tree measurement) data available.

Table 3-9: Pre-Treatment and Expected Post-Treatment Stand Information.

	Pre-treatment stand characteristics				**Expected post-treatment stand characteristics *immediately after thinning***			
Unit #	QMD2 (in.)	Overstory trees per Acre	Basal area/ac (sq ft)	Relative density index3	QMD2 (in.)	Overstory trees per acre	Basal area/ac (sq ft)	Relative density index3
1	15.3	183	234	60	17.8	94	163	38
2	13.7	242	249	67	15.2	140	176	45
3	13.7	222	231	61	17.1	86	140	33
4	12.1	289	230	66	15.1	100	125	32
5	12.0	337	263	76	14.9	110	133	35
6	12.8	283	253	71	16.0	105	147	37
7	13.3	256	248	68	15.9	110	151	38
8	12.7	267	235	66	15.4	100	129	33
9	12.2	272	221	63	15.6	86	115	29
10	10.5	304	182	56	12.9	96	87	24
11	13.1	255	240	66	16.2	89	127	32
12	12.8	278	248	69	15.5	89	117	30
13	13.2	311	294	81	16.6	109	163	40
14	12.3	273	225	64	15.2	95	120	31
15	11.3	365	252	75	14.1	98	107	28
18	12.6	310	269	76	14.7	120	142	37
19	13.1	220	206	57	15.2	107	134	35
20	12.9	251	228	64	15.3	91	116	30

In addition to the immediate impacts to the various stand characteristics discussed above, the thinnings are designed to have long-term impacts upon the future development of the units. The thinnings are expected to put the units on a trajectory toward developing some late-seral forest characteristics that may not occur without treatment or would occur at a much slower rate.
The general nature of the project's variable spaced thinning would result in scattered gaps in the canopy and patches of denser overstory trees. This would encourage various levels of limb development and tree growth, and a diverse, more developed understory. In general, the thinned units are expected to have greater windfirmness five years after treatment, and a more diverse and complex vertical and horizontal stand structure when compared to the majority of the untreated stands within the vicinity of the project. Table 3-10 compares some stand characteristics (quadratic mean diameter and trees/acre, and relative density index) after 30 years, with and without thinning, as projected by using the Forest Vegetation Simulator (FVS) modeling program (Donnelly 1997).

Table 3-10: Stand Characteristics Comparison Table

Comparison of quadratic mean diameter and trees/acre, for the stands after 30 years with and without thinning in the proposed Gauldy Thin Project.				
Post-treatment stand characteristics after 30 years			Stand characteristics after 30 years *without thinning*	
Unit# [1]	Quadratic Mean Diameter (inches)	Overstory trees/acre	Quadratic Mean Diameter (inches)	Overstory trees/acre
1	25.4	87	21.3	166
2	22.3	131	19.6	215
3	26.1	83	20.3	198
4	23.4	97	17.9	255
5	25.9	102	17.5	291
6	24.2	95	18.4	240
7	22.8	108	20.5	221
8	21.8	96	17.4	240
9	24.9	80	18.5	240
10	23.1	92	17.4	268
11	27.0	82	19.9	222
12	24.4	87	18.6	243
13	23.3	111	18.2	267
14	23.9	88	18.3	239
15	22.8	92	16.8	313
18	23.2	112	18.4	268
19	24.1	105	20.1	199
20	24.2	95	19.3	224

[1]There are no units assigned the unit numbers of 16 or 17.

Marbled Murrelet

Disturbance--All of the proposed thinning units and large portions of the associated haul routes are within one quarter mile of suitable murrelet habitat. There is an estimated 2,403 acres of suitable murrelet habitat within one quarter mile of a proposed thinning units or associated haul route. At least two of the proposed units and portions of the main haul route are adjacent to presumed occupied stands of suitable marbled murrelet habitat. Those activities that would raise the ambient noise level within one quarter mile of these occupied stands have generally been prohibited during the critical breeding season.

No activities that generate noise above the ambient level would be conducted prior to July 8 of each calendar year. Noise generating activities between July 8 and September 15 (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season) would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

Since there is suitable murrelet habitat within one quarter mile of the treatment units and along the haul route, and some harvest operations and hauling may occur during the breeding season there is potential for impacts to nesting murrelets as a result of disturbance. However, it is difficult to quantify these effects because the older stands have not been surveyed and the effects of disturbance are not fully understood. Generally it is expected that those activities, which would occur in the later part of the murrelet critical, breeding period (July 8 - August 5), [5]***May Affect - Likely to Adversely Affect*** the murrelet. Those activities that would occur during the murrelet non-critical breeding period (August 6 - September 15), ***May Affect - Not Likely to Adversely Affect*** the murrelet.

Habitat Modification--The Gauldy Project proposes to thin approximately 852 acres of 30 to 45 year-old stands that are distributed across the Gauldy Project Area in 18 treatment units .units. None of these treatment units contain trees with potentially suitable murrelet nesting platforms, nor are any of the units greater than one half-site potential tree tall. As such, the actual thinning of the treatment units is expected to have no impact upon murrelet habitat.

Many of the proposed treatment units and haul routes are intermingled with stands, which are suitable murrelet habitat. At least two of the proposed units and portions of the main haul route are directly adjacent to occupied stands of suitable marbled murrelet habitat. Although expected to be few in number (ten or less), it is possible that individual green trees or snags within these adjacent stands of suitable murrelet habitat would need to be felled as safety hazards. It is also possible that some of these trees would contain potentially suitable murrelet nesting platforms, or be adjacent to and providing cover for potentially suitable nest trees. Therefore the Gauldy Project ***May Affect - Likely to Adversely Affect*** the marbled murrelet as a result of habitat modification, based upon the potential for up to ten individual trees within adjacent stands of suitable habitat being identified as safety hazards and consequently felled.

[5] The following effects***, May Affect—Likely to Adversely*** etc., These determinations are a result of the Endangered Species Act consultation process and are relative terms used to determine the effect on these species.

Northern Spotted Owl

Disturbance--Although there are no known active owl sites in the vicinity of the proposed project area, there is an estimated 2,403 acres of unsurveyed suitable spotted owl habitat within one quarter mile of the proposed thinning units and/or the associated haul routes. There is a potential for disturbance of this unsurveyed suitable habitat during the non-critical owl-breeding period (July 7 - September 30). This potential for disturbance determination is ***May Affect but is Not Likely to Adversely Affect*** the spotted owl.

Habitat Modification--Including both spotted owl dispersal habitat and suitable habitat, approximately seventy four percent (9,404 acres) of the federal land within the Gauldy Project Area is currently in a condition to facilitate owl dispersal. The Gauldy thin project would thin approximately 11% of this federal habitat. Considering all ownerships and including both owl dispersal habitat and suitable habitat, approximately 60% (12,304 acres) of the land within the Gauldy Project Area is currently in a condition to facilitate owl dispersal. The Gauldy Project would thin approximately 7% of this total habitat.

The Gauldy Project proposes to thin 852 acres of spotted owl dispersal habitat. Some of these stands are probably poor quality dispersal habitat based upon stand age and the extremely high density of trees that could inhibit an owl's ability to fly through portions of the stand. The proposed action is expected to impact this dispersal habitat in the near term by removing trees, primarily from the smaller size classes, thereby reducing the average canopy closure from the current 85 to 95 percent, to an expected average of 60 to 65 percent. At the completion of the thinning, the forest conditions within the treatment units are expected to function as dispersal habitat for the spotted owl. In addition, to impacting canopy closure, thinnings are expected to result in felling or knocking over a number of the existing smaller snags.

Although there are no known active owl sites in the vicinity the proposed actions, many of the proposed treatment units and haul routes are intermingled with stands which are unsurveyed suitable spotted owl habitat. Although expected to be few in number (ten or less), it is possible that individual green trees or snags within these adjacent stands of suitable habitat would need to be felled as safety hazards. It is also possible that some of these trees would be suitable as spotted owl nest trees. The Gauldy Project ***May Affect - Not Likely to Adversely Affect*** the spotted owl based on habitat modification, because of the potential short-term impacts to eight hundred fifty two acres of spotted owl dispersal habitat, the potential to fell up to ten hazard trees located within suitable owl habitat adjacent to the treatment units or haul routes, and the expected beneficial long-term impacts of improved habitat in a shorter period of time than would occur without treatment.

The identified potentially negative impacts to spotted owl resulting from habitat modification are expected to be minor based upon the nature of the proposed treatments and the quality and quantity of habitat within the Gauldy Project Area; nest trees are not believed to be limiting. Approximately 34% (4,339 acres) of the federal land within the project area is considered to be suitable habitat for the spotted owl. Considering all ownerships, approximately 23% (4,739 acres) of the land within the Gauldy Project Area is considered to be suitable habitat for the spotted owl. Including both spotted owl dispersal habitat and suitable habitat, approximately 74% (9,404 acres) of the federal land within the Gauldy Project Area is currently in a condition to facilitate owl dispersal and the Gauldy thin project would thin only approximately 9% of this federal habitat. Additionally, considering all ownerships and including both owl dispersal habitat and suitable habitat, approximately 60% (12,304 acres) of the land within the Gauldy Project Area is currently in a condition to facilitate owl dispersal and the Gauldy Thin Project would thin only approximately 7% of this total habitat.

Bald Eagle

Disturbance--The nearest known bald eagle nest is located on private land approximately two miles from the nearest thinning treatment unit. There are an estimated 107 acres of suitable bald eagle habitat within one quarter mile of a proposed thinning unit and/or an associated haul route. Activities that generate noise above the ambient level may be implemented after July 7.

The Gauldy Project ***May Affect Not Likely to Adversely Affect*** the bald eagle based upon the potential for disturbance. The action is not likely to adversely affect the bald eagle based upon the fact that eagle nests tend to be very visible and there are no known nests within the area (within one quarter or a half mile line-of-sight distance). If a new bald eagle nest were discovered, any activity within one quarter mile or a half miles line-of-sight distance would immediately be evaluated for potential effects and restrictions implemented to prevent disturbances. If foraging or roosting eagles are disturbed as a result of the thinning activities they would be expected to simply move a short distance and forage or roost in other areas containing suitable habitat.

Habitat Modification--Based upon design features of the proposed Gauldy Thin Project, there are no impacts expected to the elements of bald eagle habitat. Therefore, the Gauldy Thin Project has been determined to be of ***No Effect*** upon the bald eagle based upon habitat modification.

The Road Stabilization Projects

Marbled Murrelet

Designated Critical Habitat--Portions of the Gauldy Road Stabilization Project are located within the boundaries of marbled murrelet Designated Critical Habitat Unit OR-02-b, however the due to the nature of the road stabilization project it is not expected to impact any constituent elements of Critical Habitat. Therefore, there would be of ***No Effect*** upon marbled murrelet critical habitat.

Disturbance--There are an estimated 2,257 acres of occupied or unsurveyed suitable murrelet habitat within one quarter mile of a road or road segment proposed for stabilization.

Road stabilization activities that generate noise above the ambient noise level would be prohibited between January 1 and July 7. Additionally, noise generating activities between July 8 and September 15 (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season) would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

While noise generating activities conducted as a part of the Road Stabilization project may occur as soon as July 8, activities on those roads or road segments which are within the vicinity of an occupied murrelet site or a concentration of higher quality unsurveyed suitable habitat would generally be scheduled to be implemented after August 5.

Those activities which would occur as a part of the Road Stabilization Project within the later part of the murrelet critical breeding period (July 8 - August 5), ***May Affect - Likely to Adversely Affect*** the murrelet. Those activities which would occur during the murrelet non-critical breeding period (August 6 - September 15), ***May Affect - Not Likely to Adversely Affect*** the murrelet.

In addition to the potential impacts discussed above, the road stabilization project is expected to reduce motorized access into large portions of the Gauldy Project Area. In terms of disturbance, this is expected to have a beneficial effect on marbled murrelets by reducing the amount of human activity and associated noise within the vicinity of suitable habitat.

Habitat Modification--Based upon the nature of the proposed Road Stabilization Project there are no impacts to the elements of marbled murrelet habitat. Therefore, the Road Stabilization Project has been determined to be of ***No Effect*** upon the murrelet based upon habitat modification.

Northern Spotted Owl

Disturbance--Although there are no known active owl sites in the vicinity of the proposed project area, there are an estimated 2,257 acres of unsurveyed suitable spotted owl habitat within one quarter mile of a road or road segment that is proposed for stabilization.

Road stabilization activities that generate noise above the ambient noise level would be prohibited between January 1 and July 7. While noise generating activities conducted as a part of the Road Stabilization project may occur as soon as July 8, activities on those roads or road segments which are within the vicinity of higher quality unsurveyed suitable habitat would generally be scheduled to be implemented after August 5.

The Road Stabilization would result in a ***May Affect - Not Likely to Adversely Affect*** the spotted owl because of the potential impacts resulting from disturbance within one quarter mile of a road or road segment proposed for stabilization during the non-critical breeding season (July 8 to September 30).

In addition to the potential impacts discussed above, the road stabilization project is expected to reduce motorized access into large portions of the Gauldy Project Area. In terms of disturbance, this would be expected to have a beneficial impact to spotted owls by reducing the amount of human activity and associated noise within the vicinity of suitable habitat.

Habitat Modification Based upon the nature of the proposed Road Stabilization Project there are no impacts to the elements of spotted owl habitat. Therefore, the Road Stabilization Project has been determined to be of ***No Effect*** upon the spotted owl based upon habitat modification.

Bald Eagle

Disturbance--Road stabilization activities that generate noise above the ambient noise level would be prohibited between January 1 and July 7 however activities that generate noise above the ambient level may be implemented after July 7.

Although the nearest known bald eagle nest is located approximately two miles from the nearest road segment to be stabilized there are one hundred sixty three acres of suitable bald eagle habitat within one quarter mile of a road or road segment proposed for stabilization.

Based upon these facts, the road stabilization project ***May Affect Not Likely to Adversely Affect*** the bald eagle based upon the potential impacts resulting from disturbance.

Habitat Modification--Based upon the nature of the proposed Road Stabilization Project there are no impacts to the elements of bald eagle habitat. Therefore, the Road Stabilization Project has been determined to be of ***No Effect*** upon the bald eagle based upon habitat modification.

Alternative 3--Considers private land access Relative to Proposed Action--Alternative 2, the changes to the proposed ways of managing a few of the Key roads within the Project Area under this alternative (most notably 1588-112) effectively would have no change in the ways or amount of road the general public would find accessible. Therefore, the alternative ways to maintain road access to private land that is contained within Alternative 3 is not expected to result in an appreciable difference from Alternative 2 in the expected impacts to wildlife resulting from disturbance created by the general public. Roughly the same numbers of people would be expected to utilize the area for activities such as harvesting special forest products, hunting, shooting target and recreating in general. Alternative 3 could result in an increased amount of future disturbance impacts from forest management activities on federal land as well as on some parcels of private land, as access to fewer currently untreated plantations would be lost thereby making the probability of future treatment more realistic and likely to occur.

Alternative 4--This alternative proposes that only Forest Roads 1500 and 1533 would be maintained open for public travel. They would be maintained at Maintenance Level 2 which is for high clearance vehicles only. The remaining open Forest and Temporary Roads would be decommissioned or closed to vehicle travel, and remain on the Forest Road System as they are needed for future projects. Implementation of Alternative 4 would result in an increased, short-term level of noise disturbance (relative to Alternatives 1, 2 and 3) to wildlife based upon the fact that there would be more road work associated with decommissioning or closing the roads to vehicle travel. This increased level of noise however would not be on a level to impact the viability of any of the species of concern or result in elevation of their status to any higher level of concern including the need to list under the ESA.

In the long-term, implementation of Alternative 4 would result in decreased levels of noise disturbance which potentially impact some species of wildlife (relative to Alternatives 1, 2 and 3) based upon the fact that there would be fewer roads within the Project Area open to vehicle travel. Reduced pubic access would likely result in fewer people entering the NFS lands within the Project Area to gather special forest products, hunt, target shoot and/or drive recreationally. It could also likely reduce the amount of future forest management activities as access to some plantations would effectively be eliminated. Under Alternative 4, there would be approximately 13.3 fewer miles of road open to public use relative to Alternatives 2 and 3, and 49.3 fewer miles of road open to public use relative to the No Action Alternatives. The beneficial impacts of a reduced human presence within portions of the Project Area would be most notable for those species thought to be sensitive to high road densities and/or noise and disturbance in general such as Roosevelt elk or marbled murrelet.

Wildlife-Cumulative Effects

Introduction

Impacts to wildlife resources can take many forms that include but not limited to the harming, harassing or killing of individuals; alterations to Key natural or ecological functions, relationships and/or processes such as parasitism or predator/prey relationships; and the modification or removal of habitat. Impacts from past activities as a result of disturbances in the Project Area resulted from projects such as the harvest of special forest products, road and young plantation maintenance, meadow maintenance, and dispersed recreation. There are only minor cumulative impacts anticipated from disturbance on federal wildlife resources from past federal activities for the action alternatives because activities are planned to occur late in the season when there are few recreationists and at a time when the severity of wildlife impacts are far less than earlier in the year. Additionally, most past, present, and future activities on federal lands that have the potential to disturb nesting marbled murrelets incorporate daily time restrictions to help minimize the potential for impacts, including cumulative impacts. This restriction not only helps avoid impacts to nesting murrelets but would also benefit other species with similar activity patterns

No Action Alternative

Given the expectation of continuing trends on non-federal lands within the watershed resulting in decreasing quantities of mid- and late-seral habitat, there is potential for adverse cumulative impacts associated with the "No Action" alternative. This is based upon the fact that the proposed density management projects would not take place; these projects have been designed specifically to promote the development of late-seral habitat sooner than would occur without treatment. That is to say, the accelerated development of late-seral habitat resulting from the implementation of action alternatives would in effect, be helping to offset the expected trends occurring on non-federal land; by selecting the "No Action" alternative there would be potential for adverse cumulative impacts. The timing of the potential adverse cumulative impacts associated with the "No Action" alternative would be expected to mirror the timing of the benefits associated with the implementation of the action alternative. In the case of some of the project design features such as CWD enhancement, some of the associated benefits would begin essentially at the time of project implementation, while other benefits of the thinning treatments would be expected to increase gradually over time as the reserve trees within the treated stands respond to the decreased competition (see *Silvicultural Prescription for the Gauldy Project*). There are no cumulative impacts from disturbance on federal wildlife resources for Alternative 1 because no noise generating activities are planned under this alternative.

Action Alternatives

There are only minor cumulative impacts anticipated from disturbance from present federal activities for the action alternatives because federal activities incorporate daily time restrictions where appropriate and there are relatively few activities planned to occur within the Gauldy Project Area. In addition, these projects are generally planned to occur late in the season when there are fewer recreationists and at a time when the severity of wildlife impacts are far less than earlier in the year.

There are no other federal habitat alteration projects planned in the project area, therefore there are no cumulative impacts to federal wildlife resources as a result of habitat modification anticipated from present activities on federal lands for any of the action alternatives.

While the future cumulative impacts as a result of disturbance are expected to be minor under all of the actions, they would be expected to be the least under Alternative 4 based on the fact that this alternative appreciably reduces the open road system on the National Forest Lands within the Gauldy Project Area.

State and Private Lands

Impacts to federal wildlife resources in the project area from either disturbance or habitat alternation on non-federal lands have been minimal due to the distance between the project area and non-federal ownership. There are minimal disturbance effects from non-federal land management activities on wildlife resources from past activities because of the fact that the federal lands within the Project Area are relatively blocked up and little non-federal exists within 0.25 miles of the project areas. Federal lands within the Project Area are located at the higher elevations within the Project Area while the bulk of the non-federal lands tend to be along rivers in the agricultural zones.

Less information is available on habitat altering management activities to occur on non-federal lands however, the general trend on private land is one of decreasing quantities of late-seral habitat. The majority of non-federal forestland within the Project Area is owned by industrial timber companies and is managed for timber production. This generally precludes the development and/or maintenance of late-seral habitat. While private lands within the northern portion of the Oregon Coast Range, including the Gauldy Project Area, support some dispersal habitat for the northern spotted owl, the suitable habitat for the spotted owl, marbled murrelet and bald eagle on these lands is very limited in quantity and marginal in quality thereby not notably contributing to the viability of the species (see table 2).

Before the spotted owl was listed as a threatened species under the ESA, Thomas et al. estimated in *A Conservation Strategy for the Northern Spotted Owl* (USDA and USDI 1990) that most privately-owned spotted owl habitat in Oregon would be eliminated within 10 years. Within the *Recovery Plan for the Marbled Murrelet* (USDI 1997) the USFWS recognized that most of the nesting habitat on private land had been eliminated by timber harvest and that the remaining tracts of potentially suitable habitat on private lands are subject to continuing timber harvest operations. Additionally, in most areas, second-growth forests have been or are likely to be harvested before they would attain the characteristics of older forests. Because the majority of private forestland within the vicinity of the proposed action area is managed for timber production, little spotted owl, bald eagle or murrelet suitable habitat remains on these lands. Habitat conditions on these lands are not expected to appreciably improve within the foreseeable future, and it is expected that the limited mid- and late-seral stage habitat that does remain would be greatly reduced over time.

Impacts to federal wildlife resources in the project area from either disturbance or habitat alternation on non-federal lands from future activities would be minimal due to the distance between the project area and non-federal ownership. There are no disturbance effects from non-federal activities on federal wildlife resources from future activities because all non-federal lands are greater than 0.25 miles from the Project Area.

Impacts to federal wildlife resources in the project area from either disturbance or habitat alternation on non-federal lands from present activities are minimal due to the distance between the Project Area and non-federal ownership. There are no disturbance effects from non-federal activities on federal wildlife resources from present activities because all non-federal lands are greater than one-quarter mile from the Project Area.

There are no measurable impacts to federal wildlife resources in the project area from present non-federal habitat alteration activities primarily because of the distance, but also because little habitat alteration is currently occurring. There is relatively little late-seral stage habitat located on non-federal land within the Gauldy Project Area. There are no cumulative impacts to federal wildlife resources anticipated from current activities on non-federal lands for any of the alternatives.

Management Indicator Species

Siuslaw National Forest Plan MIS species are those that represent a larger group or guild of species that are thought to be indicators of habitat change. The MIS species on the Siuslaw Forest include marten for mature older age stands, northern spotted owl for old growth conifer communities, pileated woodpecker for large snags and defective trees, primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) for small to medium size dead and defective trees, and ruffed grouse for hardwood and deciduous mixed habitats. The possible effects on them by the alternatives is discussed in the *Wildlife Resources Biological Evaluation for the Gauldy Projects*, June 10, 2003, Appendix C and summarized in Table 3-11-Alternative Effects Summary located at the end of this chapter.

Species on the Regional Forester's Sensitive Animal List

The Regional Forester's Sensitive Animal List of 11/15/00 includes wildlife species which could be found in or near the Gauldy Project Area. They include the following: the Columbia torrent salamander, southern torrent salamander (which is only documented to occur south of the Little Nestucca River), Pacific fringe-tailed bat, Baird's shrew, bufflehead, harlequin duck and peregrine falcon. The proposed activities will not likely contribute towards elevating their status to any higher level of concern, including the need to list under the ESA, nor threaten their population or species viability. The possible effects on them by the alternatives is discussed in the *Wildlife Resources Biological Evaluation for the Gauldy Projects*, June 10, 2003, Appendix C and summarized in Table 3-11-Alternative Effects Summary located at the end of this chapter.
Other sensitive species listed for the Siuslaw National Forest but not expected to occur within the Project Area include the foothill yellow-legged frog (which occurs in the southern portion of the Oregon Coast Range), and the Northwestern pond turtle (which does not occur in the northern Oregon Coast Range), Pacific shrew and California wolverine.

Survey and Manage Species

Survey Strategy Categories A and C Survey and Manage Species are those identified that require pre-disturbance surveys for all proposed habitat altering activities. A discussion of those species that may be present in the Gauldy Project Area is in the *Wildlife Resources Biological Evaluation for the Gauldy Projects*, June 10, 2003, Appendix C and summarized in Table 3-11-Alternative Effects Summary located at the end of this chapter.

Neo-Tropical Migratory Birds (Land Birds)

Landbirds use terrestrial habitats as opposed to being pelagic (ocean-going). They can be migrants or permanent residents and can use a wide variety of habitats, structural types and successional stages. Landbirds include Neotropical Migratory Birds (NTMBs), which are primarily hawks, songbirds and shorebirds that breed in the United States and winter in Central and South America. A discussion of those species that may be present in the Gauldy Project Area is in the *Wildlife Resources Biological Evaluation for the Gauldy Projects*, June 10, 2003, Appendix C and summarized in Table 3-11-Alternative Effects Summary located at the end of this chapter.

Other Activities on National Forest System Land - Limited disturbance in the Gauldy Project Area from current federal activities such as the harvest of special forest products, meadow maintenance, and dispersed recreation does occur however impacts to federal wildlife resources in the Gauldy Project Area from disturbance on federal lands are expected to be very minor. There are only minor cumulative impacts anticipated from disturbance from present federal activities for the action alternatives because federal activities incorporate daily time restrictions where appropriate and there are relatively few activities planned to occur within the Gauldy Project Area.

In addition, these projects are generally planned to occur late in the season when there are fewer recreationists and at a time when the severity of wildlife impacts are far less than earlier in the year. There are no other federal habitat alteration projects planned in the project area, therefore there are no cumulative impacts to federal wildlife resources as a result of habitat modification anticipated from present activities on federal lands for any of the action alternatives.

There are no additional federal projects planned within the Gauldy Project Area that would modify late-seral stage habitat or important habitat elements such as CWD other than those in the proposed action alternatives. Therefore, there are no cumulative impacts to wildlife resources of concern are anticipated from future activities on federal lands. The negative impacts upon habitat quality from projects likely to occur within the Gauldy Project Area such as continued meadow maintenance, road maintenance or harvest of special forest products are considered to be short-lived and negligible upon identified species of concern.

Other Determinations

Introduction

This section discusses those resources or areas that were not identified as a significant issue, but are either associated with the non-significant issues or typically included in Siuslaw National Forest's environmental analyses.

Heritage

Commercial thinning, riparian planting, and under planting: No cultural or historic sites were found in the commercial thin units by surveys conducted in FY 2002. Surveys for road stabilization, PCT and riparian planting are not needed because either the sites have been previously disturbed or the areas that may be affected are small and in areas where such sites are not located.

Project implementation would cease if any cultural resource sites were located. Documentation, evaluation, and consultation with the Oregon State Historic Preservation Officer (SHPO) would be required for the archaeological property before ground-disturbing activities would be allowed to proceed in the project area.

Economics

This section focuses on the money that may be generated from the commercial harvest and how this action may benefit the local communities and counties, and the road decommissioning costs. For the commercial harvest, two harvest systems are planned: Skyline (cable) and tractor and/or horse. In general, tractor harvesting is the most cost efficient and skyline harvesting is the next most cost efficient.

The wood manufacturing industry, including acquiring raw materials, is an important source of employment and income for residents of Yamhill, Lincoln, and Tillamook counties. These jobs, typically, pay a higher rate than the average and provide a way of life. Typically, commercial thin projects such as the proposed action are purchased by local industries and provide year around or nearly year around employment. In addition to predicted economic benefits, there are future monetary benefits that cannot be calculated in the present. For example, fisheries and riparian enhancement projects would affect the local economy by providing increased numbers of fish and wildlife, which would result in more recreational use of the area. It is also extremely difficult to establish a value of some of the project's direct and indirect benefits and costs (i.e. the value of providing habitat for nesting marbled murrelets)

For the purpose of this analysis, three factors would serve as indicators to compare the economic effects of the alternatives:

1. Acres Treated - Numbers of acres treated.
2. Volume harvested - The total CCF (hundreds of cubic feet) being harvested.
3. Revenue generated—that includes a discussion of the net gain or loss that may occur.

Alternative 1 No Action—No revenues would be generated to fund programs such as forest road maintenance, watershed enhancement projects. Approximately 12 MMBF/24,000 CCF (1 CCF equals 100 cubic feet of wood fiber) of timber, in need of thinning, would be unavailable to aid in meeting the public demand for wood products. In addition, loss of potential growth by not treating these forest stands would contribute to a future loss of federal timber receipts. In addition, approximately $120,000.00 invested by the Forest Service for planning, public scoping, and environmental analysis would be lost.

Alternatives 2, 3 and 4--These alternatives would yield approximately $1,230,000 gross revenue from approximately 852 acres. The estimated costs total $833,735. The estimated net gain of $403,000 could be used to fund forest roads and trails programs or other federal programs. The economy of the local area would also benefit by opportunities for employment.

Road Maintenance and Decommissioning Costs

The following table displays for each alternative the estimated costs to maintain and decommission Forest Roads in the Gauldy Project Area. The no action alternative shows the annualized cost to maintain the existing road system to accepted standards. This figure greatly exceeds available district funding for road maintenance. While this figure appears to be less costly than the action alternatives that include road closure and decommissioning costs, if these roads were regularly maintained to standards would exceed overall project costs of all the action alternatives within one decade. Long term costs are fairly similar among the three action alternatives as summarized in the table. Closure and decommission cost differences with the private land alternative reflect differing treatments on Forest Road 1588-112. Under the private land alternative, this road would have fill depths reduced and stabilized at a level allowing logging and management access. Alternatives 2 and 4 would completely remove fills and culverts on 1588-112.

Alternative	*Annual Maintenance	Road Closures	Decommissions	Total Close or Decommission
1 No Action	$40,400	$0	$0	$0
2 Proposed Action	$13,400	$24,940	$212,810	$237,750
3 Private Land	$13,520	$47,730	$164,550	$212,280
4 Minimal Roads	$11,120	$29,400	$212,810	$242,210

*Annual maintenance costs are for brushing, blading and ditch/culvert cleaning annualized from a three year entry cycle. Closure and decommission figures are one time costs.

Noxious and Invasive Plants

Introduction

Noxious and invasive plants are successful competitors because their seed dispersal mechanisms (wind, animal, motorized vehicle) promote their rapid spread in early-seral habitats and along disturbed road corridors. Surveys conducted in 2002 and 2003 found tansy ragwort, Himalayan blackberry, Scotch broom, and holly are among the exotic species found in the Gauldy Project Area. These plants have few natural enemies, and can fully occupy a site to the exclusion of native plants; Himalayan blackberry has been shown to effectively suppress growth of trees above the understory and ivy can cover trees entirely.

Except for shade tolerant species, such as holly, and, to some extent, blackberry, it is expected that exotic species would be out competed for light under the developing forest overstory and would decline in abundance until another disturbance occurs. Because some seeds remain viable in the soil for as long as ninety years, noxious and invasive weeds are difficult to permanently eliminate.

No Action Alternative

The number of noxious weed sites would continue to increase, but at a slower rate than under the action alternatives. The dispersal of weed seeds throughout the Gauldy Project Area would continue due to recreational use on dirt roads. It is expected that birds would continue to spread holly into the natural and young managed stands.

Action Alternatives

It would not be possible to meet the objectives of the thinning without creating some short-term favorable conditions for unwanted vegetation. Noxious and invasive weeds would become more widespread throughout the area due to ground disturbance. In addition, as thinning opens up the tree canopy, growing conditions for exotic species would improve. In order to reduce the spread of noxious weeds, heavy equipment would be cleaned, selected roadsides would be mowed or slashed, and holly would be cut and pulled. Future brush and alder release contracts would include the cutting of noxious weeds in plantations.

Cumulative Effect

Noxious and invasive plants populations would temporarily increase. Implementation of the Design Criteria in this EA, Chapter 2 would reduce or control the spread of these plants over time. Exactly how effective this would be is unknown because the exact number and distribution of populations is not known and actions that may occur on private land adjacent to NFS land in the Gauldy Project Area cannot be predicted.

Air Quality

Smoke emissions from slash burning would result in short term effects to visibility within the immediate proximity of the piles and to a lesser degree down wind. Initially smoke would be lofted up by convective heat and be transported out of the area by wind currents. The effects of these emissions would depend largely on transport winds and mixing heights. These factors are analyzed daily and approvals to and burning instruction are issued by the Salem Smoke Management Office. Following the daily smoke management instructions would reduce the potential for impacts to designated areas, such as Neskowin and Cloverdale.

All burning actives would adhere to the requirements of the Federal Clean Air Act for the Prevention of Significant Deterioration and comply with the Nation Ambient Air Quality Standards, and visibility protection. Smoke production would not exceed PM10 emissions level described in the State Implementation Plan of the Oregon Smoke Management Plan. Dust from traffic associated with the proposed actions may temporarily decrease air quality.

Scenic Resources

The scenic quality within the Gauldy Project Area is valuable to local residents and forest visitors. High quality scenery is generally described as naturally-appearing, aesthetic landscapes. Scenic resources are qualitative in nature and include the physical, biological, and cultural attributes that give a particular place meaning and value to viewers. Landscape character contributes a sense of place for people. However, one person's viewing experience may not reflect another's perspective from the same vantage point.

The Siuslaw National Forest uses Visual Quality Objectives (VQOs) to assess both landscape quality and how proposed activities might change the visual quality of a landscape. The Gauldy Project Area is included in those areas with a VQO of modification. The proposed actions would not dramatically affect this resource.

Environmental Justice

The action alternatives were assessed to determine if there would be a disproportionately impact to minority or low income populations, in accordance with Executive Order 12898. The areas that may be influenced by the proposed activities are Lincoln and Tillamook Counties, Oregon. Based upon census information from the State, Native Americans are the only minority group in these counties whose population level is higher than the state average. They were contacted about the proposed activity during the scoping process. They did not comment on the project. Since these activities are small in size and duration, it appears that Native Americans would not be adversely affected.

The poverty level in Lincoln County, based upon State information, is above the state average. This means the number of families in the county that have incomes below the state's poverty level is higher than the state's average. For Tillamook, this is reversed. Articles discussing the project were placed for two weeks in each of the county's newspapers. These activities if done may provide some employment to these families. However, the effects would be temporary, because these activities are small in size and duration.

Vegetation Management

The potential risks associated with any competing vegetation control activities are discussed at length in the Region 6 Final Environmental Impact Statement for Competing and Unwanted Vegetation and in the supplemental volume entitled "Characterization and Management of Risk" (R6 FEIS). Potential risks for the Gauldy Project Area are expected to be similar to those described in the R6 FEIS. Potential health effects would also be minimized by following mitigation measures described in Chapter II of the R6 FEIS and following requirements of the Forest Service "Health and Safety Code Handbook".

Site-specific vegetation management analysis was conducted and documented only for noxious weed and conifer release associated with under-planting in accordance with the Region 6 Environmental Impact Statement for Managing Competing and Unwanted Vegetation (FEIS) and Mediated Agreement dated May 24, 1989. Provisions of the FEIS do not apply to commercial and precommercial thinning. This analysis is available for public review during the 30-day comment period for this EA.

None of the alternatives propose the use of herbicides or broadcast burning. Chainsaw removal of brush may be done to release under-planted trees. Noxious weed control would be accomplished by pulling or cutting with chainsaws, or release of natural controls (e.g. flea beetle releases to control Scotch broom).

Special Forest Products

Special Forest Products include removal/harvest of forest products such as moss, Christmas trees, and mushrooms and many types of plants for a variety of uses. They are sold both for personal and commercial uses. The Hebo Ranger District is divided into areas that are designated for these uses. A rotation has been established so that these areas are rested for some period of time to allow the resources to recover. This rotation also allows for a sustained use or production of these products.

There are commercial businesses that focus on gathering these products. Many are minority-owned businesses located in the Willamette Valley. Since the Forest Roads provide access to these areas, and the trend is for less Forest Roads to e open, it is expected that there would be less opportunity to gather these products.

Fire/Fuels

Introduction

Aggressive fire suppression will be needed although the fire danger in this area is normally low to moderate. Humans cause an estimated ninety five percent of the wildfires on the Siuslaw NF. Permanent closure of roads would reduce ignition risk. However, roads also allow access to areas for equipment and fire suppression forces, and serve as fire breaks and lines of control for fire suppression.

Existing Condition

Fuel conditions in the project area are generally within the range of natural variability for each seral class represented and for the landscape as a whole. These stands are on average more densely stocked than natural stands would be at an early age. However, these stands also are probably outside the range of natural variability in terms of the proportion of their composition represented by Douglas-fir. Swiss Needle Cast has had an adverse effect on the growth and development of Douglas-fir in this and other areas in the Coast Range. In some areas of the Coast Range where the needle disease conditions are severe tree mortality has occurred. If conditions in the project area became severe this could result in increased fire hazard.

Desired Condition

The desired condition is to increase the proportion of late-seral stage conifer stand cover in the project area. Reducing the risk of fire is essential in order to allow time for development of large blocks of late-seral vegetation and to protect what remains of existing late-seral habitat.

Effect of the Alternatives

No Action Alternative

The risk of man caused ignitions would decrease as roads close. Conversely, wildland fire resistance to control would increase.

Action Alternatives

All of the Alternatives prescribe some road closures. The effects described above apply. The degree depends on how many and which roads are closed. These road closures would affect how fire control is done on private and State land, as the Forest Roads provide access to these lands. The exact impacts are difficult to quantify due to the dynamics of fire and its control.

The risk of wildfire would temporary increase, due to the large amounts of slash left on the ground after thinnings. Implementation of the design criteria in Chapter 2 would lessen this risk.

Cumulative Effect

The trend is less open roads in the Gauldy Project Area. This may have two effects: Reducing the man caused risk, but increasing the resistance to control.

Table 3-11 Alternatives Effects Summary Comparison Table

This table summarizes the effects of the No Action and 3 action alternatives. It also summarizes the effects of those resources associated with the non-significant issues and those resources included in Environmental Assessments prepared by the Siuslaw National Forest.

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Air Quality	None	Air quality--Good	No change	Minor effects—due to dust from equipment and smoke from burning piles	Same as Alternative 1	Same as Alternative 1
Soil						
Compaction	Acres	207	Should improve over time as soil building occurs on compacted sites	Reduces compaction by 49 acres over time.	Reduces compaction by 47 acres over time.	Reduces compaction by 153 acres over time.
Stability	N/A	N/A	Due to lack of maintenance, some roads may fail. Surface erosion continues in stands with dense canopies.	Fewer roads that may fail left on the landscape. Better road maintenance. Less surface erosion in thinned stands.	Same as Alternative 2	Less risk of road failure than Alternatives 1 and 2. Less surface erosion in thinned stands.
Productivity	N/A	N/A	Slight increase, as disturbed sites recover.	Productivity greater than Alter. 1 as more sites are improved and stands are thinned..	Slightly less than Alter. 2 as more roads remain on the landscape. Erosion from thinned stands less.	Greatest increase in productivity as conditions on disturbed sites is improved. Erosion from thinned stands less.
Aquatics						
Road Densities	N/A	Subwatershed not properly functioning due high road density and roads adjacent to streams	Very little change in the short term. As roads become unusable due to instability and brush growth, the number of road miles would decrease in the subwatersheds.	Improvement both in the short and long term as roads are decommissioned	Slightly less improvement than Alternative 2 as more roads remain on the landscape.	Greatest improvement of any of the Alternatives, as most roads decommissioned.

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Sedimentation	N/A	No quantitative data exists in any subwatersheds are at risk.	Sediment amounts that may reach streams should average about the same. Less over time as roads fail and brush in.	As roads are decommissioned and brushed in, less sediment may reach streams than Alter. 1. No sediment from commercial units due to buffers.	Slightly less improvement than Alter. 2 due some roads left on the landscape. No sediment from commercial units due to buffers.	Greatest improvement as most roads are decommissioned. No sediment from commercial units due to buffers.
T&E Fish Species						
Oregon Coast coho salmon	N/A		**No Effect—**because 1) no further harvest would occur as a result of this alternative, and 2) other management activities (i.e. road maintenance, planting, thinning, etc.) have been screened on a project-basis and have been found to have no effect on Oregon Coast coho salmon.	**May Affect, but are not Likely to Adversely Affect,** because 1) the proposed action alternatives having immeasurably low impacts to aquatic systems within the Gauldy Area, and 2) road decommissioning would decrease road-related sediment over time. 3. Following the Forest Plan standards and guidelines and Best Management Practices should minimize the effects of management activities on aquatic systems.	Same as Alternative 2	Same as Alternative 2
Sensitive Fish Species						
Oregon Coast steelhead	N/A	Suspected to occur because suitable habitat exists and because area is within range of occurrence.	**No Effect**--because: 1) no further timber harvest would occur as a result of this alternative, and 2) other management activities (i.e. road maintenance, planting, thinning, etc.) are low impact and improve watershed conditions over time	**May Effect, not Likely to Adversely Affect**, because: 1) the proposed action and its alternatives having immeasurably low impacts to aquatic systems within the Gauldy Area, and 2) the proposed road decommissioning activities effects will be minimal and temporary.	Same as Alternative 2	Same as Alternative 2

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Oregon Coast cutthroat trout	N/A	Suspected to occur because suitable habitat exists and because area is within range of occurrence.	**No Effect**--because: 1) no further timber harvest would occur as a result of this alternative, and 2) other management activities (i.e. road maintenance, planting, thinning, etc.) are low impact and improve watershed conditions over time	**May Effect, not Likely to Adversely Affect**, because: 1) the proposed action and its alternatives having immeasurably low impacts to aquatic systems within the Gauldy Area, and 2) the proposed road decommissioning activities effects would be minimal and temporary.	Same as Alternative 2	Same as Alternative 2
Wildlife						
T and E species						
Murrelet	Acres	Designated critical and suitable habitat—about 4,740 acres in the Gauldy Area.	No disturbance effects. Late-successional forest characteristics development delayed or does not occur at all. Positive population change potentially delayed.	Disturbance may affect about 4.660 acres. May affect abut 10 trees that may be critical habitat trees in mature stands. Changes in stand conditions in the thinned units improve the probability these stands can be used for nesting better sooner than Alternative 1.	Same as Alternative 2	Similar impacts to habitat as in Alternative 2. Greater short-term disturbance impacts as more road-work would occur. Potentially fewer long-term disturbance impacts as a result of fewer roads in the are
Northern spotted owl	narrative	Suitable and dispersal habitat—about 7,400 acres in the Gauldy Area.	No disturbance effects. Late-successional forest characteristics development delayed or does not occur at all. Positive population change potentially delayed.	Disturbance may affect about 4.660 acres. Affects minimized by seasonal restrictions design criteria. Habitat modification affects about 860 acres. Changes in stand conditions improve the probability these stands will function as suitable habitat sooner than Alternative 1.	Same as Alternative 2	Similar impacts to habitat as in alternative 2. Greater short-term disturbance impacts as more road-work would occur. Potentially fewer long-term disturbance impacts as a result of fewer roads in the area.

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Northern Bald Eagle	narrative	Suitable habitat—about 1,034 acres in the Gauldy Area.	No effects.	Disturbance may affect about 270 acres. Affects minimized by seasonal restriction design criteria.	Same as Alternative 2	Greater short-term disturbance impacts as more road-work would occur. Potentially fewer long-term disturbance impacts as a result of fewer roads in the Area.
Other T&E species not in the area and not affected by the project:, Western snowy plover, Brown pelican, Aleutian Canada goose, Oregon silverspot butterfly, Nelson's checker mallow, and Western lily.	N/A	Outside range or no suitable habitat within Area	N/A	N/A	N/A	N/A
Management Indicator Species						
Pileated woodpecker	narrative	Suitable habitat present in the Gauldy Area.	Late-successional forest characteristics development delayed or does not occurred at all.	Promotion of Late-successional forest characteristics.	Same as Alternative 2	Similar impacts to habitat as in alternative 2. Greater short-term disturbance impacts as more road-work would occur. Potentially fewer long-term disturbance impacts as a result of fewer roads in the Area.
Primary cavity excavators	narrative	Suitable habitat present in the Gauldy Area and within the proposed thinning units.	Increasing numbers of snags (especially small snags) expected within the stands as a result of suppression mortality.	Many of the existing smaller snags likely would be knocked over or felled as safety hazards. Fewer numbers of snags expected in the future than under the Alter. 1. Mitigation measures minimize negative impacts.	Same as Alter. 2	Similar impacts to habitat as in alternative 2. Greater short-term disturbance impacts as more road-work would occur. Potentially fewer long-term disturbance impacts as a result of fewer roads in the Area.

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Ruffed grouse		Suitable habitat present in the Gauldy Project Area and within the proposed thinning units.	Minimal impacts	Minimal impacts	Same as Alter. 2	Same as Alter. 2
Survey and Manage species that may be found in the Gauldy Area.						
Red Tree Voles	N/A	Red Tree Voles may inhabit the mature stands adjacent to the units. Proposed units provide dispersal habitat.	Not treating the young stands may reduce the opportunity for population expansion.	The young stand treatments would improve conditions for population expansion.	Same as Alter. 2	Same as Alter. 2
Terrestrial Mollusks	N/As	Suitable habitat present in the Gauldy Area. S&M mollusks found in most of the units.	Not treating the young stands may reduce the opportunity for population expansion.	Surveys completed in all units. Found sites protected from disturbance. Unit treatments may improve habitat conditions to allow population expansion	Same as Alter. 2	Same as Alter. 2
Regional Foresters Sensitive Species-That may be found in the Project Area.						
Columbia Torrent Salamander	narrative	Found on the Hebo Ranger District north of Little Nestucca River. They are closely tied to gravel and small cobbles in flowing or seeping shallow water.	No effect	Streams and seeps and protected. Effects, if any, expected to be minimal.	Same as Alter. 2	Same as Alter. 2

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Pacific fringe-tailed bat	narrative	Roosts in buildings, rock crevices and under bridges. Habitat very limited on Federal Land in the Project Area.	No effect	Minimal impacts expected	Minimal impacts expected	Minimal impacts expected
Bairds Shrew	narrative		No effect	Very minor impacts	Very minor impacts	Very minor impacts
Bufflehead	narrative		No effect	No effect	No effect	No effect
Harlequin Duck	narrative		No effect	No effect	No effect	No effect
Peregrine Falcon	narrative		No effect	No effect	No effect	No effect
Land birds	narrative	Of these "species of concern", 16 are declining on National Forest lands; 10 of these 16 occur within the Gauldy Planning Area. Four of these species use early successional habitats and two other species prefer alder-dominated habitats. The other 4 species prefer conifer-dominated habitats	No effect	Very minor impacts from disturbance due to seasonal restrictions. Habitat modification-some species such as Hammond's flycatcher may benefit others such as the Pacific slope flycatcher may not benefit by the planned thinning	Same as Alt 2	Same as Alt 2

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Deer and Elk	narrative	Where topographic features or understory vegetation exist, plantations provide hiding cover (cover used for security) for deer and elk. Unthinned stands provide thermal cover (cover used for protection from adverse weather conditions) and hiding cover. High road density may limit current habitat quality especially for elk.	No effect	Minor negative impacts to hiding and thermal cover. Minor beneficial impacts to forage and browse. Improvements to habitat from reduction of the open roads within the Project Areas that are open to the public from 66.6 miles to 30.6 miles	Fewer negative impacts to hiding and thermal cover, and fewer beneficial impacts to forage and browse than Alternative 2 because no PCT. Improvements to habitat from reduction of the roads within the Project Areas that are open to the public from 66.6 miles to 30.6 miles	Same as Alt 3 except greater improvements to habitat quality from reduction of roads within the Project Areas, that are open to the public from 66.6 miles to 17.3 miles.
Road Management	N/A	N/A	No change by management actions. Some roads expected to close. Roads that are open remain so. Annualized maintenance costs about $40,000.	Closes/decommissions about 60 miles of Forest and temporary roads. 29 miles open for public use. Access to State land remains open. Private land access closed. Construct about 0.2 mile temporary roads for commercial harvest operations. Reduces annualized road maintenance costs by $29,000. Maintenance funds still insufficient. Result- additional roads may close.	Similar to Alternative 2, except roads that access private land remain on the landscape, but closed to public use. Road maintenance funds same as Alternative 2 Construct about .2 mile temporary roads for commercial harvest.	Closes/decommissions about 70 miles of Forest and Temporary roads. 17.1 Forest Road miles open for public use. Private land access remains on the landscape but closed to public use. State land access closed. Construct about 0 .2 mile temp roads for commercial harvest operations. Road maintenance funds match work needed.

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Vegetation						
Young managed stands	Acres	Approximately 5,000 acres of young managed stands that need treatment.	No stands treated. Delayed late-successional forest development. Some stands may never develop these desired characteristics.	Improves stand conditions on about 2,600 acres: About 1,000 acres in commercial units (852 acres actually thinning. About 1,600 acres precommercially thinned	Improves stand conditions on about 1,000 acres in commercial units(852 actually thinned) PCT not included in this Alternative	Same as Alternative 3.
Lichens	N/A	3 species-Not expected to be found in the young managed stands.	Not treating the young stands may reduce the opportunity for population expansion.	Unit treatments may improve habitat conditions to allow population expansion	Same as Alter. 2	Same as Alter. 2
Moss	N/A	1 species-Not expected to be found in the young managed stands.	Not treating the young stands may reduce the opportunity for population expansion.	Unit treatments may improve habitat conditions to allow population expansion	Same as Alter. 2	Same as Alter. 2
Fungi	N/A	No currently listed survey and manage fungi occur in young managed stands.	Not treating the young stands may reduce the opportunity for population expansion.	Unit treatments may improve habitat conditions to allow population expansion	Same as Alter. 2	Same as Alter. 2
Noxious and Invasive Weeds	N/A	Holly, tansy ragwort, blackberry and Scot's broom are present. No estimate of numbers or extent of populations.	Not treated by this project.	Holly, Scotch broom and blackberry manually controlled in treated units. Natural control releases for tansy ragwort.	Same as Alter. 2	Same as Alter. 2

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Recreation	N/A	Dispersed recreation is the dominant activity in the analysis area. Roads are important for this resource	As roads fail, some losses of recreational opportunities would occur. Better/more road maintenance on the roads that are left open may reduce this effect.	This alternative closes/decommissions about half of the open roads. This would reduce recreational opportunities. Better/more road maintenance on the roads that are left open may reduce this effect.	Effects similar to Alternative 2	Closes about 80% of the open roads. Greatest negative impact on recreation.
Heritage	N/A	The proposed commercial thin units and temporary road locations surveyed for cultural sites. None were found.	No effect	Surveys indicate that no sites are present. If found they would be protected.	Same Alternative 2.	Same Alternative 2.
Economics (only commercial thinning. The road management costs is in the road management section of this table)	Dollars	N/A	No revenues that could be used to fund programs such as Forest Roads and trails maintenance. In addition, loss of potential growth by not treating these forest stands would contribute to a future loss of federal timber receipts, and the approximately $120,000.00 invested by the Forest Service for planning, public scoping, and environmental analysis would be lost.	Would yield approximately $1,230,000 gross revenue. The estimated costs total $833,735. The estimated net amount of $403,000 could be used to fund Forest Roads and Trails programs or other federal programs. The economy of the local area would also benefit by opportunities for employment.	Same as Alternative 2	Same as Alternative 2
Visual Quality	N/A	Maximum Modification	No change	No effect	No effect	No effect

Resource/Attribute	Unit of Measure	Existing Condition	Alternatives			
			Alter 1 No Action	***Alter2. Proposed Action***	***Alter 3 Private Land Access***	***Alter 4 Minimal Road System***
Special Forest Products	N/A	This is done on the District in areas set up annually on a rotation basis. Roads provide access to the areas.	As roads close, less opportunities.	About half the open roads closed. The trend is for less open roads on the Hebo District and Siuslaw Forest which would reduce opportunities.	Same Alternative 2.	Closes about 80% of open roads. The trend is for less open roads on the Forest and district. Opportunities to remove these products are reduced.
Fire/Fuels Management	N/A	Roads provide the primary access for fire control and fuels management. Man caused ignitions greatest risk.	No immediate effect. As roads close, ability to control wildland fire becomes less. Overtime man caused ignitions less due to less access.	Closure of the open roads would hamper wildland fire control on National Forest, private and state lands. Less access reduces risk of man caused ignitions.	Same as Alternative 2	Greatest hindrance to control wildland fires, due to less access. Potential for man caused ignition lowest due to less access.

Probable Environmental Effects That Cannot Be Avoided

Implementation of any alternatives may result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the Design Criteria listed in Chapter 2, Forest Plan Standards and Guidelines and Best Management Practices. If management activities occur, however, some effects cannot be avoided. Even the No Action alternative has effects.

Cultural Resources

There is no assurance that every cultural resource site would be located in advance of all planned management activities. Some ground-disturbing activity may affect an undiscovered historic or prehistoric site. Sites discovered in this manner would be immediately protected from further disturbance.

Wildlife

Some disturbance may occur due to activities occurring during the murrelet and spotted owl nesting seasons. The continual use of open Forest Roads may disturb some wildlife species.

The quantity and quality of late-successional habitat may be reduced due to delayed development and/or no change in stand structure of those young managed stands that are not treated.

Air Quality

Temporary seasonal effects on air quality are unavoidable under any of the action alternatives, due to dust from traffic associated with them and smoke from burning slash piles. These effects would be temporary.

Recreation

There would be loss of dispersed recreational opportunities and experiences as the roads become closed.

Soil Resources

If stands are not treated some soil displacement is expected to occur due to closed canopies and the resulting lack of ground cover vegetation. For those roads not treated some failures are expected.

Under the action alternatives, some soil displacement and compaction is expected due to road stabilization, temporary road construction and ground based equipment uses.

Water Quality

The No Action alternative would result in down stream damage due to road failures. The young managed stands would not be treated, which means either delayed development of large trees as a source of large woody debris for streams or in some cases this may never occur as these stands stay stagnated until replaced by some natural event. Some minor sediment may occur from road stabilization actions. These are expected to be temporary. Commercial thinning would remove some potential course woody debris from the system.

Relationship between Short-Term Use and Long-Term Productivity

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource.

Soil Resources

As described in the Soil Resource section of this chapter, proposed activities would result in a decrease in long-term soil productivity for areas where soil is compacted or heavily disturbed. Over time productivity is expected to increase as compaction is reduced and stand treatments improve vegetation growth.

Water Quality

The results of effects analysis indicates that stream channel conditions are expected to be protected, and quality is not expected to be impacted by proposed activities. Short-term effects may occur as described in the Aquatic Resources section of this chapter, however no long term impacts are expected, and the trend on NFS land over time is expected to improve.

Wildlife

Short term—May be disturbance of nesting, and/or fledging murrelets and/or spotted owls by commercial thin activities are anticipated to occur for about 5 years once the operations begin.

Long term development of late-successional habitat should improve murrelet and spotted owl habitat. If the young managed stands are not treated, late-successional “productivity” would be delayed and may not occur.

Vegetation

Harvest of timber would reduce snag and down recruitment in the smaller size classes for several decades in return for speeding up recruitment in the larger size classes.

Air Quality

The temporary impacts of smoke from slash burning and road dust from vehicles associated with proposed activities would have minor, short-term effects on visual quality and recreation use.

Minimizing the risks from wildfire offsets for the short-term impacts and long-term, increased site productivity. Slash burning would reduce the risk of wildfire; trading these short term impacts off for long term risk reduction and the associated site productivity impacts of hotter burning wildfires.

Recreation

The long term trend is for less dispersed recreation opportunities due to reduced road access.

Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources refers to the loss of production or use of a resource due to a land use decision that once executed cannot be changed. An irretrievable commitment of resources applies to losses of production or use of renewable resources for a period of time.

Soil Productivity

Soil compaction, heavy disturbance, and erosion caused by road building and decommissioning, and by timber ground based harvest operations would reduce soil productivity. The time lost in this state of lower productivity is irretrievable, but the soil resource can be rebuilt over long periods of time. None of the alternatives would result in an irreversible commitment of this resource.

Vegetation

Timber harvest would change plant succession, stand development, and species composition. If some of the stands are not treated due to road failure or decommissioning, the time lost for them to develop late-successional characteristics is irretrievable. If the stands are damaged or destroyed, the time lost for replacement is irretrievable.

The need for stream buffers would increase the time that large trees are developed as a source of large wood for streams. The time lost to develop big trees for large wood for streams is irretrievable.

Air Quality

The impact of slash burning and road dust would have temporary seasonal impacts on the air quality in all alternatives except Alternative 1 (No Action). Reduction of air quality would constitute a short-term irretrievable resource impact.

Wildlife

The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover.

Cultural Resources

Any activity that disturbs a cultural resource may be an irreversible and usually irretrievable commitment of these resources.

Recreation

The loss of recreational opportunities in time and space, as roads become closed, is irretrievable.

Required Disclosures

Effects of Alternatives on Social Groups: There would be no overall differences between alternatives in effects on minorities, Native American Indians, women, or the civil liberties of any American citizen.

Effects on Floodplains and Wetlands: There are wet meadows, and ponds within the Gauldy Area. These wetlands would be buffered should not experience any significant adverse effects from management activities. The floodplains within the Gauldy Area would not receive measurable impact by upstream influences. Management activities designed to protect these resources conform to the federal regulations for floodplains (Executive Order 11900) and wetlands (Executive Order 11990).

Energy Requirements and Conservation Potential of Alternatives: The energy required to implement the alternatives in terms of petroleum products would be insignificant when viewed in light of the production costs and effects on the national and worldwide petroleum reserves.

Effects of Alternatives on Prime Rangeland, Forest Land, and Farm Land: The alternatives presented are in compliance with Federal Regulations for prime lands. The definition of prime forest land does not apply to lands within the National Forests. No federally-managed land in the Gauldy Area is classified as rangeland. In all alternatives, Federal lands would be managed with the appropriate consideration to the effects on adjacent lands.

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USDA-Forest Service Roadless Area Conservation, Final Environmental Impact Statement, November 2000.

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USDA FS - USDA Forest Service. 1994. Access and travel management guide. Corvallis, OR: Siuslaw National Forest.

USDA FS - USDA Forest Service. 2003b. Road Analysis Report. Corvallis, OR: Siuslaw National Forest.

Wildlife Resources Biological Evaluation for the Gauldy Projects, June 10, 2003, prepared by Steve Bahe, Wildlife Biologist.

4. List of Preparers

Forest Service Interdisciplinary Team

Steve Garza and Skip Bailey	Siuslaw NF	Fuels and Fire Management
Steve Bahe	Tillamook, BLM	Wildlife
Brent Erskine	Siuslaw NF	Team Leader, EA writer, Recreation
Wayne Patterson	Siuslaw NF	Silviculture, Plants
Dan Johnson	Siuslaw NF	Logging Systems Specialist/GIS
Jack Sleeper	Siuslaw NF	Fisheries
Doug Shank	Willamette NF	Soils/Hydrology
Ken McCall	Siuslaw NF	Transportation Planner
Maurice Jeffries	Siuslaw NF	Sale Administrator

Additional support and review provided by:

Rich Babcock	Siuslaw NF	Cultural Resources

5. Consultation and Coordination with other Federal Agencies

U.S. Fish and Wildlife Service

On March 26, 2002 a field trip was conducted to the Gauldy project for USFWS biologists Dave Clayton and Bridget Tuerler, to review major aspects of the proposed actions. In May 2002 the Forest Service requested informal and formal consultation with the U.S. Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act. At issue are the potential impacts to bald eagles, northern spotted owls and marbled murrelets. The Service issued a biological opinion [FWS reference: 1-7-02-F-744] that supported the determinations in the Gauldy Thin and Road Stabilization Projects Biological Assessment, May 22, 2002. The determinations of effects on these species are included in these two documents and summarized in this Environmental Assessment, Chapter 3; Wildlife Section.

National Oceanic and Atmospheric Administration (NOAA Fisheries)

In November 2002 the Forest Service sent to NOAA Fisheries a biological assessment (BA) requesting concurrence with a determination that the proposed action is "not likely to adversely affect" (NLAA) the Oregon Coast coho salmon pursuant to 7(a) (2) of the Endangered Species Act, and to meet the requirements for consultation under the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Fisheries concurs with this determination for the following reasons (page 6, NOAA Fisheries Letter, December 11, 2002): (1) New roads would be limited and located on stable ridge tops; (2) stream channel shade is likely to be minimally affected; (3) water temperatures in coho habitat are unlikely to change significantly; (4) harvest methods, haul routes and haul restrictions with the potential for releases of sediment to coho salmon are unlikely; (5) recruitment of functional wood would not be significantly reduced; (6) habitat contamination from fertilizer use would not occur; (7) riparian buffers would protect downslope water quality; and (8) risk of slope failure would not be appreciably altered by the proposed action.

6. Comments to Environmental Assessment and Forest Service comments

This chapter discusses the comments received about the Gauldy Project during the official 30 day comment period. The Oregon Natural Resources Council (ONRC) and Simpson Resource Company submitted the following comments.

Oregon Natural Resources Council Comments

Comment 1: How to best achieve variable spacing should have been an issue in the EA. The imposition of variability on relatively uniform stands is the most important objective of these treatments. Achieving such variability is still considered experimental and operationally challenging. The EA proposes to use upper and lower diameter limits as a means to achieve variability, but the EA should have considered a variety of techniques, maybe as simple as using having the cutters alternate the use of different diameter limits at different times of day in order to enhance the establishment of higher and lower density areas of different sizes.

Forest Service response: The use of diameter limits is only one of the methods proposed for achieving variability. Out of 18 units, nine will be thinned using diameter limit prescriptions. Four units will be thinned through the use of "designation by description" prescriptions that are based on spacing off the largest tree in an area. All the trees within a given distance of the largest tree (as long as they are less than 20 inches at breast height, and an included species) are cut. Once these trees are cut the next largest tree is located and all the trees within a given distance of it are cut. If the stated distance for example is 15 feet, the distance between leave trees will vary between 15 and 30 feet but over the whole unit will usually average 22.5 feet. This technique does not result in cutting all the small trees in the unit. Because of the way trees are spaced, small diameters and lower crown classes are still represented among the leave trees. Two units will be treated through a combination of diameter limit and designation by description. The remaining three units will be marked by the Forest Service using prescriptions designed to promote variability and to allow for the development of some large open-grown trees.

Variability will be further enhanced in units where species such as western hemlock, Sitka spruce, western red cedar and red alder are not being cut. The units will also contain scattered leave areas.

The proposal to alternate diameter limits at different times of the day is not operationally feasible.

Comment 2: The "openings" created as part of the variable thinning should not be mini-clearcuts, but rather they should be small areas that are very heavily thinned.

Forest Service response: Within the context of this project, the creation of openings (1/4 to 1 acre) without trees is only a possibility with the diameter limit prescriptions. The diameter limits were selected to create variability while still maintaining the desired average number of trees per acre. Some of gaps may not have any trees in them following harvest although the overwhelming majority of them will. This statement is based on observations made during stand reconnaissance and stand examination plots. Openings larger than ¼ acre in size without trees are very unlikely. Openings are typical features in mature stands and their creation is designed to encourage understory vegetation and the initiation of structural diversity. The creation of openings is permitted under the Northwest Forest Plan.

Comment 3: Swiss needle cast should have been an issue in the EA. There is uncertainty about whether thinning could exacerbate the incidence of SNC. The EA makes unsupported and overconfident assertions that thinning will not affect SNC. If this was an EA issue, instead of thinning cedar, hemlock, and spruce, as proposed, the Forest Service would have considered leaving all non-Douglas fir species as a hedge against the uncertainty of SNC.

Forest Service response: There is no evidence that thinning could exacerbate the incidence of Swiss needle cast. Removing Douglas-fir trees will result in fewer host trees. However, there is a concern that thinning infected stands may exacerbate the disease's effects on the remaining Douglas-fir, particularly by increasing the stress on needles exposed to the drying action of wind. Conversely, it is possible that because thinning increases the amount of resources available to the remaining trees, they will be more vigorous, develop larger crowns and be in a better position to maintain growth in spite of the disease. The stands under consideration are not considered to have a high Swiss needle cast severity rating. The objective of thinning these stands is to maintain or increase the growth rates of the remaining trees. It is certain that without thinning growth rates will decline. Thinning of Douglas-fir on the Hebo Ranger District has been demonstrated to improve growth rates and canopy development even with the presence of Swiss needle cast. Another objective, the development of an understory, particularly the initiation of a second canopy layer of shade-tolerant trees, can only be achieved by opening up the Douglas-fir canopy by thinning. Species other than Douglas-fir are only being thinned when they occur in densities that warrant thinning. Not thinning these trees as a hedge will leave them in an overstocked condition and less able to respond to a decline in Douglas-fir.

Comment 4: The most significant short-coming of the EA is the fact that it fails to disclose the location or extent of temporary roads that will be used, constructed, and/or decommissioned. The EA even indicates that new road/stream crossings will be constructed. These are typically one of the worst sources of erosion and sedimentation. The absence of detailed information on temporary roads in the EA means that the effects on soil, water, and fish are not adequately described to meet the letter and intent of the National Environmental Policy Act. The NLAA finding for coho is also unsupportable without this temporary road information. The main reason for the concern is that the information on roads and their impacts should be in the EA, not developed and considered afterwards and outside the NEPA process.

Forest Service response: There are two temporary roads categories: Existing and those that would be constructed. The analysis of the Area included a review of all of the known temporary roads in the Area. The total temporary road miles are listed on EA page 2-17. This mileage represents roads that exist on the ground, but are not included on the Forest Service Road System, because they are not needed to either support public travel or continual long term administration of National Forest Land. They, however, may be needed for a one time, short term use. All of these roads are closed to public travel. About 9 miles of the existing temporary roads would be used to support the commercial thin activities of this Project, and as indicated on page 2-17 these roads would be closed. The impacts of these existing roads are described in the EA Chapter 3 Affected Environment and Environmental Consequences to the resources they affect. For soils their effect is included in Table 3-1 Road Acres, EA page 3-10. The effects of those temporary roads that would affect aquatic habitat, particularly on T&E fish species is disclosed on EA pages 3-20 and 3-24.

Due to the size of the Project Area, it is difficult to show all the locations of all these roads on the Gauldy Project Map 1 Proposed Action because of its large scale, and many of these roads are very short segments. The locations of these roads are shown on the commercial sale unit maps. These maps are located in the Maps section of this EA.

Page 2-14, shows the amount of proposed temporary road construction. This .2 mile would be done in: unit 4--850 feet, unit 7—90 feet and unit 20—240 feet. These roads would not cross any streams. Their effect on soil is disclosed on Table 3-1 Road Access. These small roads segments would not affect aquatic habitat, because they are located on ridges. The road for unit 4 is about 500 feet from any live water source. The roads for units 7 and 20 are isolated from streams by ridges. Again, because these segments lengths are small, they were not included on the Gauldy Project Map 1 Proposed Action Map. They are shown on the commercial sale unit maps located in the Maps section of this EA.

Comment 5: The roads table on page 2-14 is unclear. The column headings are ambiguous and there are two columns both labeled “miles” but with different values.

Forest Service response: We agree that Table 2-5 on page 2-14 is confusing. The modified table is listed below. We clarified the column heading. The values remain the same. The new category, Opening existing (temporary) roads, is added to this Table and Table 2-7. This category clarifies the amount to existing temporary roads that would be opened and used for commercial operations. These roads would be closed when they are not needed.

Table 2-5 (revised): Existing Condition and Alternative 2 Road Miles by Road Category

Road Category	Existing Condition/Miles	Proposed Action/Miles
***Forest Roads**-Maintenance Levels		
Level 1	3.1	28.3
Level 2	49.1	29.0
Level 3	17.1	None
Level 4	None	None
Level 5	None	None
****Temporary Roads**		
Existing	17.0	None
Proposed new	None	.2
Opening existing roads	None	9.0
Decommissioned Roads	N/A	29.0

*Forest Roads—Roads on the Forest Road and Trail System.

**Temporary Roads—Existing Roads not included in the Forest Road and Trail System. These roads are typically short segments used to access cable landing. They are closed to public travel and maybe re-opened for project use and closed.

Table 2-7(revised)--Comparison of Fully Evaluated Alternatives

This table displays a comparison of the results of the various proposed actions of the fully evaluated alternatives.

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Private Land Access	Alternative 4 Minimal Road System
Vegetation Management				
Commercial Thinning--Acres	0	854	854	854
Stream Side Thinning--CWD creation-Estimated Acres	0	100	100	100
Individual Tree Release--Acres	0	10	10	10
Riparian Planting –Estimated Acres	0	10	10	10
Logging/Road Use				
Ground skidding/horse (acres)	0	88	88	88
Skyline Yarding (acres)	0	766	766	766
Temporary Road Construction (miles)	0	.2	.2	.2
Specified Road Construction (miles)	0	0	0	0
Specified Road Reconstruction (miles)	0	0	0	0
Existing temporary roads that would be opened.(miles)	0	9.0	9.0	9.0
Road Management				
Miles of Forest Road Decommissioned	0	*12.0	*10.0	*52.2
Miles of Forest Road open to public use	66.1	29.0	29.0	17.1
Miles of Forest Road retained on the Forest Service System, Maintenance. Level 1.	3.2	28.3	30.3	0
Miles of Road on the landscape, but managed under Road Use Permits.	0	0	3.0	0
Existing Temporary Road miles	17.0	N/A	N/A	N/A
Private land access	No change	Eliminated	Maintained	Eliminated
Oregon State land access	No change	Eliminated	Eliminated	Eliminated
30 to 45 year old stand acres that may not be treated due road decommissioning	N/A	542	393	1,089

*Excludes existing and proposed temporary roads, because they are considered closed.

Comment 6: We want to reinforce the agency's commitment to pre-commercial thinning. The EA indicates that pre-commercial thinning that was part of the scoping notice has been deferred to another analysis. We want to emphasize the importance of treating these younger stands that are most plastic and most amenable to treatment to enhance and accelerate late-successional old-growth habitat.

Forest Service response: We agree that precommercial thinning is the most effective way of achieving our objectives. Precommercial thinning is on-going and is being handled as categorical exclusions, since there is very little concern about this activity.

Comment 7: Trees that are especially useful to wildlife such as broken and forked trees should all be retained. The EA says such trees will be retained proportionate to their pre-treatment representation. This approach fails to recognize that such features are severely under-represented in a plantation. Fork, injuries and broken tops are much more common in native young forest with lots of legacy components, e.g. snags falling on top of young reprod.

Forest Service response: The particular forms of damage common in these stands, such as forked trees, old snow and ice breaks and rot induced by bear damage are found throughout all size classes of trees within these stands. Diameter limit and designation by description prescriptions are "blind" to these defects, selecting the trees solely on other criteria. Because of this, we feel adequate numbers of defective trees will remain. Leaving all defective trees would be counter productive to other thinning objectives.

Comment 8: We are pleased that horse-logging is being considered for flat ground. Please be sure to take steps to avoid and minimize the spread of weeds in the horse droppings.

Forest Service response: It is important to us that the spread of noxious or invasive weeds be prevented or at least minimized. To do this for horses, the following design criteria will be included in the sale contract:

"While on National Forest Land, the required horse feed is weed free pellets".

Also, the Gauldy Project K-V Plan will include mitigation funding to monitor and control weeds in those areas affected by the Project.

Comment 9: The EA is inconsistent about the criteria for soil impacts. Page 2-5 indicates that the goal is t avoid 15% compaction "not including roads and landings" but page 3-8 uses the 20% standard that does include roads and landings. From a rational biological perspective, roads and landings must be considered. And since much of the treatment area is LSR and Riparian Reserve, the 20% is too permissive.

Forest Service response: This comment refers to Design Criteria number 13 on page 2-5. This is a Siuslaw Forest Plan Standard and Guideline FW-107, page IV 50-b. The 20% standard listed on page 3-8 is a Region 6 Standard, which includes the 15% standard included in the Forest Plan and an additional 5% for roads and landing. This 20% is an upper limit for compaction. Projects that result in cumulative acreage compaction equal to or greater than 20% should not be done without mitigation.

In the Gauldy Project EA, the analysis of compaction is disclosed on pages 3-9 -3-12. In summary, the total compaction in the Project Area is about 207 acres. This includes existing roads, landing, rock outcrops etc. These 207 acres represents about 1% of the Project Area that is compacted. This is far below the 20% upper limit of about 2,400 acres.

The compaction in the harvest units including roads and landings is estimated to be 3.4% (Table 3-1 Soil Impacts Table, page 3-10), which is well below the upper limit of 170 acres (15% within the units plus 5% for the roads and landings associated with the units). Cumulatively an anticipated result from the Action Alternatives is compaction over time will decrease due road decommissioning. (See EA pages, 3-10-3-12)

Comment 10: Page 2-6 indicates that log haul could occur until October 31st. The DN should clarify that hauling should cease during wet periods (e.g., anytime there are puddles on the roads).

Forest Service response: Log haul for this Project would occur during the dry season. Log haul is managed by the Design Criteria listed in the EA on pages 2-3-2-6 and the Siuslaw National Forest Road Rules. These Road rules specify, based on the conditions of the roads on National Forest System Land, how and when they will be used for commercial haul. Since these Rules are part of each Siuslaw National Forest timber sale contract, they, as well as many other standard contract provisions, were not included in this Project's Design Criteria. By proper implementation of the Design Criteria and the timber sale contract provisions, the direct and indirect effects on roads and other resources is anticipated to be minimal.

Comment 11: Pages 6-50 and 6-51(now page 7-53) alleges a short-term benefit from the proposed action in terms of road sediment compared to the no action alternative, but this fails to acknowledge the effect of road construction, road use, yarding, as well as culvert removal and road ripping.

Forest Service response: As described in the EA, pages 3-11-3-12 and 3-19-3-25, the proposed management actions goals are designed to improve watershed conditions. These are not met by the No Action Alternative. To clarify, the information on page 7-53 Objective 5 is modified by the following. Changes are in brackets:

Alternative 1 No Action: The development of the young managed stands would continue, but at various rates. [Sedimentation--The amount of sediment that may reach streams should average about the same. There may periods where there is more sediment if the vulnerable roads fail and maintenance is not performed at the level needed because of the lack of funding to do the needed maintenance. As some roads brush in and become impassible by standard vehicles, some reduction in sediment rates is anticipated over the long term. If the high risk culverts, with deep fills, are not removed there could be serious downstream impacts over an extended geographic area if they fail.]

Alternatives 2, 3 and 4: A goal of the proposed actions is reduction of sediment from roads by better maintenance and the young managed stands by improvement of growing conditions for understory vegetation. Implementation of these actions would reduce the amount of sediment that may reach the streams in the Gauldy Project Area in the short term versus what may occur under the No Action Alternative.

[In all action alternatives road mileage decreases and maintenance improves. Road decommissioning would remove barriers (culverts and fills) to wood transport (individually and in debris torrents) so that wood can accumulate in historic locations and can be transported downstream at natural rates. Thus, long-term effects of the project are expected to reduce road impacts to aquatic resources, continuing the trend of habitat restoration, pages 3-19-3-24.]

[Some soil displacement would continue from exposed areas, but should be temporary as the disturbed areas revegetate. However, by following the design criteria listed this EA, effects should be slight. As more light reaches the ground in the thinned stands more vegetation would grow. Some sediment is expected from culvert removal and open Forest Roads. There may be slight increases in compaction and displacement from road decommissioning and temporary road construction but they would be temporary. Some sediment may occur from road maintenance of graveled surfaced roads, however better maintenance would reduce the levels to small amounts, pages, 3-9, 3-11 and 3-12.]

[The major source of compaction (and also much disturbance) is ground based skidding equipment. Unrestricted tractor yarding and tractor piling are not considered an option on those landtypes where side-slopes are gentle enough (generally less than 30%) to support tractor usage. The silty nature of the fine grained soils, and evidence that significant soil moisture is available most of the year indicate that any type of unrestricted tractor yarding and piling (even low ground pressure) would lead to unacceptable soil compaction and/or disturbance. Restricted tractor yarding from predesignated skid roads is considered an option if the adversely affected area is less than 15% of the activity area. With tractor yarding, skid roads are predesignated, (approved in advance of use by the Timber Sale Officer) and generally 150 to 200 feet apart. With a processor/forwarder system the skid roads are usually only about 50 to 60 feet apart, but the number of trips for each individual road are substantially less than with skidding.

Monitoring has shown that when designated skid roads are properly utilized in conjunction with line pulling and directional falling, compaction from ground based tractor operations generally remains at about 9% to 11%. Finally, much of the ground-based harvest may be implemented with horse logging methods. This is likely the case for Unit 11, and the ground based parts of Unit 4 and 10. Horse logging impacts approximately one half the area that mechanical systems impact. Skyline operations in thinning units with small wood and intermediate supports usually impacts less than one percent of the unit area, EA pages 3-9 and 3-10.]

Simpson Resource Company

Comment 12: Simpson Resource Company telephoned the district and spoke with the District Ranger to reiterate a concern they addressed in scoping, that Forest Roads 1588-122 and 1588-120 not be decommissioned. These Forest Roads are very important to provide Simpson Resource Company reasonably access from both an economic and resource protection standpoint.

Forest Service response: We understand the importance of access to Simpson Resource Company lands by these roads. Alternative 3 in the EA closes these roads to public travel but makes them available to Simpson for future access to their lands.

7. Appendix

A. Project Files located at the Hebo Ranger District

Scoping documentation

Gauldy Project comment summary document

Analysis Reports

Soil and Watershed Report, Gauldy Timber Sale, April 1, 2002

Gauldy Planning Area-Fuels Prescription, March 14, 2002

Gauldy Thin Logging Feasibility Report, March 4, 2002

Biological Assessment of Fisheries Resources prepared for NMFS, Gauldy Project, Siuslaw National Forest, Hebo Ranger District, October 22, 2002

Biological Assessment of Wildlife Resources prepared for USFWS —For the Gauldy Thin and Road Stabilization Projects, Siuslaw National Forest, Hebo Ranger District, May 22, 2002

Wildlife Resources Biological Evaluation for the Gauldy Projects, June 10, 2003

Gauldy Project Road Analysis, April 2003

Analysis of the Gauldy Project proposed actions and Alternatives on Recreation Resources in the Gauldy Area, January 2003

Pre-project Heritage Resource Inventory

B. Other Issues

Introduction

The following are the comments and concerns received during scoping that were determined to be non-significant issues, because: 1) they are covered by the significant issues discussed in Chapter 1. 2) They are covered by mitigations discussed in Chapter 2. 3) Do not address specific aspects of the proposed actions and, therefore are irrelevant to the decisions that may be made. The issue or concern is listed and with it is a reason or reasons why it is not considered significant.

Oregon Natural Resources Council Letter: July 11, 2000

1. Roads EA—The Forest Service is required to justify the new roads and prioritize efforts to maintain and decommission roads considering environmental and economic implications. (The EA/EIS must clearly state whether any roads are proposed for construction or reconstruction within Riparian Reserves and which of these, if any, require stream crossings.)

> **Discussion:** Roads and road management are discussed in the EA, pages 1-5-6, 1-12, 1-14, 2-14-16, 3-1-33, 3-46-50, and 3-52. The proposed new temporary roads would not be in Riparian Reserves.

2. Roadless/Wilderness Areas & Road Building Issues—Avoid timber harvest, roads, mining, development and motorized recreation in roadless areas $\geq$ 1,000 acres or any roadless area adjacent to existing wilderness or parks or all inventoried roadless areas. The EA/EIS should clearly state whether the project is in any portion of a roadless area inventoried during RARE II process, or in a non-inventoried roadless area $\geq$ 1,000 acres or adjacent to inventoried roadless or designated wilderness. A full EIS should be prepared for this project if it involves entry into an inventoried or uninventoried roadless area.

> **Discussion:** The Gauldy Project Area is not in an inventoried roadless area, nor adjacent to either a wilderness area or inventoried roadless. The Gauldy Project Area has been reviewed during the several RARE reviews and the Roadless Area Conservation EIS. It is not a roadless area or unroaded area. This comment is irrelevant to the decisions that may be made.

3. Old Growth—Avoid commercial timber harvest, roads and mining in late-seral forests. Impacts on old-growth species should be discussed in detail in the EA/EIS. This should include a functional analysis of dispersal for the northern spotted owl between LSRs, and analysis of effects on such species as the goshawk, Canada Lynx, woodpeckers, Pine Marten, California Wolverine, Red Tree Vole, Great Gray Owl, Pygmy Nuthatch, Bald Eagle and other special status species listed in applicable management plans. Special attention to snag habitat is needed.

Discussion: The ROD, page F-4 References/Index/Glossary, for the Spotted Owl Forest Plan Amendment, defines old-growth as "A forest stand usually at least 180-220 years old with moderate to high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incident large trees, some 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." The *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*, defines late-seral as stands that are between the ages of eighty and one hundred 49. The proposed thinnings would be done in young managed stands, five to thirty five years old. Mining is not part of the propose actions. Road use would occur for the most part on existing roads. The small amount of temporary roads that are needed do not go through old-growth, or late-seral stands.

The effects on the various T&E and special status species that may be found in the Gauldy Project Area is discussed in the EA, pages 3-34-50, and 7-7-7-48**.**

4. Fish and Wildlife—Special status species surveys must be completed prior to developing NEPA alternatives and before the decision is determined. On-the ground field reconnaissance surveys must be done and used to develop NEPA alternatives.

Discussion: The appropriate surveys have been completed. The results are disclosed in the Environmental Assessment on pages 3-33-51**.**

5. Water Quality—Project analysis should separately discuss each of the Aquatic Conservation Strategy objectives (under the Northwest Forest Plan). Any commercial harvest activities or road construction in key watersheds or municipal watersheds should be avoided in order to protect water quality.

Discussion: Technically, there is no Northwest Forest Plan. The commenter used this colloquial expression for the Record of Decision (ROD) and its associated *EIS of Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.* This ROD amended the existing Siuslaw Forest Plan. The effects on water quality and aquatic species and habitats are disclosed on EA pages, 3-17-3-24**.**

The ROD, pages B-9, B-11 describe how the Aquatic Conservation Objectives should be met. Essentially by meeting the Forest Plan Standards and Guidelines the objectives are met. Since the proposed actions are designed to meet these Standards and Guidelines, the objectives are also met.

The Cloverdale elementary school municipal watershed is in the Gauldy Project Area. Its location is shown on Gauldy Project Map 2. There are no pipelines or water diversion structures in this small watershed. The school's water sources are two wells located on school property. They have no plans to develop any water sources in or near this watershed. None of the proposed actions would occur in this watershed.

6. NEPA Documentation—a full range of action alternatives should be considered for this sale. These alternatives should include wildlife enhancement, restoration, old growth protection (minimum fragmentation), and non-motorized recreation.

Discussion: The alternatives are discussed on EA pages, 2-1-2-20**.** There is no discussion about non-motorized recreation, as this is outside the scope of this EA. A goal of the proposed actions is to maintain and/or enhance wildlife habitat. None of the proposed actions affect old-growth.

Oregon Department of Fish and Wildlife (ODFW) North Coast Watershed District—Tillamook, Oregon

ODFW submitted two letters, May 14, 2002 with comments. Both are discussed in this section.

1. ODFW recommends retaining the maximum amounts of down woody debris possible. Existing dead and down logs should not be yarded from the stand for commercial thinning purposes.

Discussion: It is anticipated none of this material would be removed. There is a design criteria listed in the EA, pages 2-2-2-6, which addresses this.

2. Snag creation and treatment of existing snags is not addressed specifically in the (scoping) document.

Discussion: This is discussed in the EA, page 3-30.

3. Also, existing snag densities and classification are not mentioned under the "current stand conditions" section. ODFW recommends retention of all existing snags through topping to achieve the overall two snags per acre target. In stands where the trees average less than 10" DBH, it may be preferable to wait until the second thinning entry to create a larger, more durable snag.

Discussion: The discussion about snags is included on page 3-30 of the EA. It is expected that all snags would remain, except those would create a safety hazard to the crews working in the stands. If they are cut, they would be left as down wood.

4. One of the proposed actions that may occur is under-planting western red cedar in the commercially thinned areas to promote species diversity and understory development. To avoid what could likely be near 100% loss to elk browsing, ODFW recommends that a high priority be given to protective measures for seedlings of this favorite elk browse species.

Discussion: This recommendation is included in the Gauldy Project Silvicultural Prescription**.**

5. Under Proposed Action, Section 1C (A)—Streamside Thinning—in the Scoping Document the first statement says "streamside vegetation and down wood would be maintained by not harvesting trees in areas adjacent to all permanently flowing and **most** intermittent streams." ODFW supports this concept; however, we suggest that **all** intermittent streams be included. We recognize that shading is not an issue when these streams are dry. However, it is the wet period of the year when these streams are flowing that is the most likely time for soil erosion to occur. All areas where erosion could occur and sediments could be transported downstream should be afforded some degree of protection. Streamside buffers should be large enough to be effective and consideration should be given to the current status of each site (i.e.; areas with active erosion should be given larger buffers).

Discussion: The EA, pages, 3-13-25, and 3-68-70 discusses the effects of the proposed thinnings and effects on water quality and aquatic habitat.

6. Riparian Planting—it states in the Scoping Document, "No alder would be cut within 15 feet of the streams. ODFW supports transition to mixed alder-conifer stands in riparian areas." However removal of alders along streams should be evaluated on a site-by-site basis.

Discussion: The proposed treatment was developed following evaluations of the individual sites.

7. Under Proposed Action, Section –Road Management, the Scoping Document state, "Roads not needed for future management…would be decommissioned and partial to full restoration of stream channel by removing culverts and fills." ODFW supports the removal of culverts on roads that are decommissioned. Improvements to fish passage and decreased risk of road failures at stream crossings are desirable results. ODFW does require that any instream work be completed during the period from July 1 to September 15. Any work outside this period requires prior approval from ODFW.

Discussion: The recommended culvert removal period is included as a Design Criteria, in the EA.

Larry and Pam Abrams

There are private residences near the junction of Forest Road 15 and State Highway 130. These comments refer to the traffic and use of Forest Road 15.

1. Condition of road (Forest Road 15) during and after logging.

Discussion: The Timber Sale Contract requires that the roads be in the same condition once logging is finished, that they were prior to logging beginning.

2. Speed and dust control of all vehicles.

Discussion: Dust abatement and speed control would be included the Timber Sale Contract. A special emphasis would be made along about one mile of Forest Road 15 above the residences.

Hampton Tree Farms (David Kunert)

1. This project area appears to be infested (at a severe level) with Swiss needle cast. After revisiting some previous thinning sites on Oregon Department of Forestry managed lands that were infected with Swiss needle cast, it appears the thinning has increased the extent of the symptoms, it my opinion that the fastest way to advance this management area toward late-successional is a shelterwood cut leaving the species that are not bothered by Swiss needle cast. If this followed through as you have planned, I feel you are inviting additional disease and fire.

> **Discussion:** Doing a shelterwood cut in the commercial stands would result in canopy closure to be less that 60% after the thinnings. The US Fish and Wildlife Service have determined that this may have an adverse effect on the northern spotted owl. In an effort to minimize the effects on Threatened and Endangered species, the Siuslaw National Forest designs project to not have adverse affects on these species.

Thinning is anticipated to exacerbate the symptoms of Swiss needle cast. However, most stands do not appear to be as heavily infected as the Wildcat Thinning Study, so no mortality is anticipated from Swiss needle cast is anticipated, but crown growth and vigor would be greatly reduced.

Phil Johnson

1. The section of Forest Road 15 from the Little Nestucca River Road that passes through the private properties near this junction should be re-blacktopped. This section is in bad condition and would be more so after logging.

> **Discussion:** Presently, this section can sustain logging traffic. If it is damaged it would be repaired to its present condition. Due to very limited road maintenance funding, the re –paving this section would not be done.

C. Wildlife Biological Evaluation

U.S. Department of Agriculture
US Forest Service
Siuslaw National Forest
Hebo Ranger District

WILDLIFE RESOURCES
BIOLOGICAL EVALUATION
FOR THE GAULDY PROJECTS

Prepared by: Steve Bahe, Wildlife Biologist
Date: June 10, 2003

I. Introduction

The purpose of this Biological Evaluation (BE) is to determine and document any effects from the Gauldy project alternatives upon the following:

1. Threatened, endangered, or proposed species as listed under the Endangered Species Act of 1973 (ESA), as amended
2. Designated critical habitats for ESA listed species
3. Regional Forester's Sensitive Species
4. Management Indicator Species
5. Survey and Manage species
6. Land birds
7. Roosevelt elk and black-tailed deer

This BE addresses only wildlife resources and as such, does not address fish or plant species.

Units of measure: The units of measure used in this BE for the impact analysis of the various projects upon wildlife resources include the following:

Species listed under the ESA - The determination of effects call pursuant to the ESA, and a narrative discussion describing the expected impacts as it relates to the potential for disturbance; impacts to suitable habitat; and in the case of the spotted owl, impacts to dispersal habitat.

Critical Habitat Designated under the ESA - The ESA effects call and a narrative discussion describing the expected impacts as it relates to habitat elements of Designated Critical Habitat.

Regional Forester's Sensitive Species - A narrative discussion describing the expected impacts, and a statement as to the resultant potential elevation of their status to any higher level of concern including the need to list under the ESA.

Management Indicator Species - A narrative discussion describing the expected impacts.

Survey and Manage mollusks - A narrative discussion describing the expected impacts as it relates to the maintenance and enhancement of the species at the site.

Survey and Manage red tree voles - The protection of the physical integrity of the nest site to maintain its population and provide for expansion of the number of active nests at the site.

Land Birds - A narrative discussion describing the expected impacts as it relates to the potential for disturbance and impacts to habitat types.

Elk and Deer - A narrative discussion describing the expected impacts as it relates to the potential for disturbance and impacts to elements of their habitat.

The Elements of the Gauldy Project: The Gauldy project includes commercial thinning, precommercial thinning, and road stabilization. For the purposes of this BE, the Gauldy project is being analyzed as three projects.

1. Commercial Thinning including associated activities such as road construction, road reconstruction, road maintenance, felling, yarding, hauling, CWD creation within the treatment units, and additional mitigation features including planting and CWD creation at other locations within the Project Area.
2. Precommercial Thinning within densely stocked, young plantations.
3. Road Management including reducing motorized access and altering the current maintenance classification level. Forest roads would be stabilized, which may include installing waterbars and/or cleaning of culverts and ditches; all entrances would be blocked to vehicle access. Additional forest roads would be decommissioned which may include removing culverts, scarification of the road surface, blocking entrances and/or some side-cast pullback.

II. The Affected Environment

The Gauldy Project Area is located approximately 6 miles southwest of Pacific City, Oregon, in Tillamook County. For the purpose of this BE, the Project Area is defined as the area located east of US Highway101, west of Highway SR22, and north of the Highway SR130, the Little Nestucca Highway. It is located within watersheds of the Nestucca Bay, specifically the Nestucca River watershed and the Little Nestucca watershed.

A description of the watershed and surrounding landscape is included within the *Nestucca Watershed Analysis* (dated October 1994), the *Little Nestucca Watershed Analysis* (dated June 1998) as well as the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area* (dated January 1998).

Affected Environment - Commercial Thinning Project

The 18 proposed Gauldy commercial thinning units are spread across 15 sections within the Project Area, including Township 4 South, Range 10 West, Sections 24, 25 and 36; Township 4 South, Range 9 West, Section 31; Township 5 South, Range 10 West, Sections 1, 2, 12, 13, and 14; Township 5 South, Range 9 West, Section 6, 7, 8, 18, 19, 30, Willamette Meridian (see Figure 1 of Biological Assessment - USDA, May 2002).

All of the proposed commercial thinning treatment units, totaling approximately 852 acres, are located within the North Coast AMA (Adaptive Management Area) as identified within the Northwest Forest Plan. Some of the areas proposed for treatment, totaling 348 acres, are also located within the LSR (Late Successional Reserve) land use allocation (LSR #RO807); LSR acres within the AMA are commonly referred to as AMR. Approximately 52% (446 acres) of the proposed treatment units, which includes both the AMA and AMR acres, are also located within the Riparian Reserve land use allocation (see Table 1).

Table 1. Approximate Total Acreages of the Proposed Gauldy Commercial Thinning Treatment Units by Land Use Allocations

	Acres not located in Riparian Reserves	Acres located in Riparian Reserves	Total Acres
Acres of AMA	240	264	504
Acres of AMR (both AMA and LSR Land Use Allocation)	166	182	348
Total Acres	406	446	852

The proposed thinning project would occur within planted mixed conifer stands predominately composed of Douglas-fir, western hemlock and Sitka spruce which vary in age from approximately 30- to 45-years-old. Many of the proposed treatment areas were precommercially thinned to meet timber production objectives in the 1970's or 1980's. Almost without exception, the stands to be treated are densely stocked and lack a diverse structure.

The commercial thinning project would treat approximately 852 acres distributed in 18 irregularly shaped units that average approximately 49 acres in size; they range from about 3 to 120 acres in size. The treatment units are intermingled with stands throughout the Project Area which are not proposed for treatment. In general, the stands not proposed for treatment are either young plantations 10- to 20-years-old, plantations of a similar age and condition as those being thinned (many of which were excluded from treatment areas because of S&M concerns), or natural stands which are older than the stands proposed for thinning. These older stands are composed of large, second-growth Sitka spruce, western hemlock and Douglas firs generally about 80- to 110-years-old, as well as scattered hardwoods and an uncommon old-growth fir component. Often they have a relatively sparse or "clumpy" conifer stocking resulting in very large, limby conifers and hardwoods and a more developed understory; in general the natural stands within the Project Area are structurally very diverse.

In addition to the 18 treatment units, several other identified areas will receive CWD or individual tree release treatments as mitigation measures or design features associated with the commercial thinning project. A 40-year-old stand approximately 5 to 10 acres in size which is adjacent to unit 6 and of a similar age and condition as the stand being treated, would be treated with an "individual tree release" treatment to promote the development of late-seral stage forest structure. Within approximately 50 to 100 acres of dense Douglas-fir dominated stands located within the Project Area, 10 to 50 trees per acre would be girdled or cut and left on site to augment existing CWD levels and encourage the development of scattered larger trees.

Affected Environment--The Commercial Thinning Project as it relates to Wildlife Species Federally Listed as Threatened or Endangered, and their Designated Critical Habitats.

Marbled Murrelet

Some of the proposed project areas are located within the boundaries of marbled murrelet Designated Critical Habitat unit OR-02-b, however the proposed thinning units, being less than one-half site potential tree tall, are not designated as Critical Habitat (USDI 1996).

A general description of the marbled murrelet habitat within the Project Area and/or the surrounding landscape is included within the *Nestucca Watershed Analysis* (October 1994), *Little Nestucca Watershed Analysis* (June 1998) and the North Coast LSRA. Table 2 displays the quantity of murrelet habitat within the Project Area. Approximately 34% (4,339 acres) of the federal land within the Project Area is currently considered to be suitable habitat for the marbled murrelet. Considering all ownerships, approximately 23% (4,739 acres) of the land within the Project Area is currently considered to be suitable habitat for the marbled murrelet; an estimated 2,403 acres of this suitable habitat is within 0.25 miles of a proposed thinning unit and/or an associated haul route.

Located within a band which is situated approximately 2 to 8 miles from the ocean, much of the suitable murrelet habitat within the Project Area is considered to be of a relatively high quality. This is based on the fact that many of the 80- to 110-years-old stands are composed of large, second-growth Sitka spruce, western hemlock and Douglas firs as well as an uncommon old-growth fir component. Most of these older stands often have a relatively sparse or "clumpy" conifer stocking resulting in very diverse stand structure containing large, limby conifers with abundant moss and multiple potentially suitable murrelet nesting platforms.

Table 2. Estimated Acres of Spotted Owl Dispersal Habitat, and Spotted Owl, Marbled Murrelet and Bald Eagle Suitable Habitat within the Gauldy Project Area*.

Habitat Classification	Acres on Siuslaw National Forest (% of Federal Land within Project Area*)	Non-Federal Acres including State or Private **	Total Acres (% of Total Project Area*)
"Non-Habitat" (approximately 0- to 30-years-old)	3301 (26%)	4,740 (~72% agricultural, 28% plantations)	8,041 (39%)
Spotted Owl Dispersal Habitat (stands approximately 31- to 75-years-old)	5,065 (40%)	2,500	7,565 (37%)
Spotted Owl and Marbled Murrelet Suitable Habitat - (stands greater than approximately 76-years-old)	4,339 (34%)	400	4,739 (23%)
Bald Eagle Suitable Habitat	734 (31%)	300	1,034 (14%)
Total Acres within the Project Area*	12,705	7,663	20,391
Total Acres within eagle Project Area*	2,364	4,932	7,296

*The Project Area includes lands located east of US Highway 101, and west of Highway SR22, and north of Highway SR130 (the Little Nestucca Highway). In the case of the bald eagle, the Project Area includes only those acres within one mile of a large major river or lake or 0.5 mile of major tributary and located east of US Highway101, and west of Highway SR22, and north of Highway SR130.

**Some of the data on non-federal land is about 20-years-old; the "Non-Habitat" classification is expected to comprise a larger percentage of the non-federal land than is displayed on this table as a result of harvest activities within older timber types.

None of the suitable murrelet habitat located within the vicinity of the proposed projects is considered to be currently surveyed to protocol standards as defined by the *Inland Survey Protocol for the Marbled Murrelet* prepared by the Pacific Seabird Group. However, there have been protocol surveys conducted within the general vicinity of some of the proposed treatment units and/or haul routes within the last decade; these surveys resulted in the identification of several occupied sites. These occupied sites are contained within a large contiguous stand of suitable murrelet habitat approximately 1000 acres in size which is located roughly in the center of the Project Area; the occupied portions of this stand have not been delineated. Based on the relative high quality of much of the habitat within the Project Area and proximity of these stands to the ocean, it would be expected that there are a number of additional unidentified murrelet nest sites within the vicinity of some of the project areas.

The commercial thinning project proposes to thin approximately 852 acres of 30- to 45-year-old forest which is distributed in 18 treatment units across 15 sections. None of these treatment units contain trees with potentially suitable murrelet nesting platforms, nor are any of the units greater in height than one half site potential tree. Many of the proposed treatment units and haul routes are intermingled with stands which are suitable murrelet habitat. At least two of the proposed units and portions of the main haul route are directly adjacent to occupied stands of suitable marbled murrelet habitat.

Northern Spotted Owl

There is no Designated Critical Habitat for the northern spotted owl located within the Project Area (USDI 1992). There are no spotted owl RPAs (Reserve Pair Areas) within the Project Area; RPAs were delineated within the document entitled *Delineation and Management of Reserve Pair Areas within Oregon's Northern Coast Range Adaptive Management Area*, dated June 1, 2000 which is considered supplemental guidance to North Coast LSRA (USDA and USDI 1998).

Including both spotted owl dispersal habitat and suitable habitat, approximately 74% (9,404 acres) of the federal land within the Project Area is currently in a condition to facilitate owl dispersal. The commercial thinning project would thin approximately 11% of this federal habitat. Considering all ownerships and including both owl dispersal habitat and suitable habitat, approximately 60% (12,304 acres) of the land within the Project Area is currently in a condition to facilitate owl dispersal. The commercial thinning project would thin approximately 7% of this total habitat. Table 2 displays the quantity of spotted owl habitat within the Project Area.

The commercial thinning project proposes to thin 852 acres of spotted owl dispersal habitat. Some of these stands are probably poor quality dispersal habitat based upon stand age and the extreme high density of trees which could inhibit an owl's ability to fly through portions of the stand. The average canopy closure of this dispersal habitat is currently estimated to be approximately 85 to 95 percent.

Although there are no known active owl sites in the vicinity of the proposed project area, many of the proposed treatment units and haul routes are intermingled with stands which are unsurveyed suitable spotted owl habitat. There is an estimated 2,403 acres of unsurveyed suitable spotted owl habitat within 0.25 miles of the proposed thinning units and/or the associated haul routes.

Bald Eagle

Bald eagles generally nest and/or roost within mature forested stands within one mile of a large major river or lake, or within 0.5 mile of a major tributary. Applying the habitat criteria above and considering the proximity of the Nestucca Bay, and larger creeks or rivers including the lower end of Clear Creek, the mainstem of the Nestucca River, Little Nestucca River and Three Rivers, there are a total of 7,296 acres of land within the Project Area which is within the stated distances of the various bodies of water. Approximately 32% of this acreage (2,364 acres) is within the Siuslaw National Forest; approximately 31% (734 acres) of these federal acres are stocked with mature forest (over 18" DBH) and thereby considered suitable bald eagle habitat. Although recent data is lacking, there may be up to an additional 300 acres of suitable bald eagle habitat within the Project Area located on non-federal land. Table 2 displays the quantity of bald eagle habitat within the Project Area. There are an estimated 107 acres of suitable bald eagle habitat within 0.25 miles of a proposed thinning unit and/or an associated haul route. None of the thinning units are currently considered to be suitable bald eagle habitat.

The nearest known bald eagle nest is located on private land approximately 2 miles from the nearest thinning treatment unit.

Affected Environment - The Precommercial Thinning Project as it relates to Wildlife Species Federally Listed as Threatened or Endangered, and their Designated Critical Habitats.

The proposed precommercial thinnings would take place within approximately 1,658 acres of 7- to 15-year-old, densely stocked plantations which are distributed throughout the Project Area. Although many of the proposed precommercial thinning treatment units are intermingled with stands which are suitable habitat for the marbled murrelet, spotted owl and/or bald eagle, none of the PCT units are considered to suitable habitat for these species or dispersal habitat for the spotted owl.

Affected Environment - The Roads Management Project as it relates to Wildlife Species Federally Listed as Threatened or Endangered, and their Designated Critical Habitats.

The road stabilization projects are spread across approximately 20 sections throughout the Project Area. Some of the roads or road segments which are proposed for stabilization are located within or adjacent to some of the proposed Gauldy precommercial and/or commercial thinning units, while others are located up to approximately one mile from the nearest thinning unit. Some of the roads proposed for stabilization pass through or are adjacent to stands determined to be suitable habitat for the spotted owl, marbled murrelet and/or bald eagle. Considering all ownerships, there are an estimated 2,257 acres of suitable spotted owl and marbled murrelet habitat, and 163 acres of suitable bald eagle habitat within 0.25 miles of a road or road segment proposed for stabilization.

Affected Environment for all Gauldy Projects including commercial thinning, precommercial thinning and roads management as it relates to species identified as Sensitive on the Regional Forester's List, Management Indicator Species, Survey and Manage Species, Landbirds, Elk and Deer.

Species on the Regional Forester's Sensitive Animal List

The Regional Forester's Sensitive Animal List of 11/15/00 includes wildlife species which could be found in or near the Gauldy Project Area. They include the following: the Columbia torrent salamander, southern torrent salamander (which is only documented to occur south of the Little Nestucca River), Pacific fringe-tailed bat, Baird's shrew, bufflehead, harlequin duck and peregrine falcon. The proposed activities will not likely contribute towards elevating their status to any higher level of concern, including the need to list under the ESA, nor threaten their population or species viability.

Other sensitive species listed for the Siuslaw National Forest but not expected to occur within the Project Area include the foothill yellow-legged frog (which occurs in the southern portion of the Oregon Coast Range), and the Northwestern pond turtle (which does not occur in the northern Oregon Coast Range), Pacific shrew and California wolverine.

Columbia Torrent Salamander (*Rhyacotriton kezeri*)

The Columbia torrent salamander is found on the Hebo Ranger District north of the Little Nestucca River. Suitable habitat for this species is located within riparian zones throughout the Project Area which includes areas located in and near the proposed project areas.

Torrent salamanders live in gravel and under small cobbles in flowing or seeping shallow water. They are associated with cold, silt-free springs, seeps, headwater streams and splash zones. They prefer small, cold streams with moss and gravel to large, turbulent streams (Nussbaum et.al. 1983). During rainy periods, adults are known to forage within a few meters of water in streamside debris (Corkran and Thoms 1996). They have little tolerance to warm or dry conditions.

Southern Torrent Salamander (*Rhyacotriton variegates*)

Like the Columbia torrent salamander, the southern torrent salamander lives in very cold, clear springs, seeps and headwater streams. It is documented in the northern Coast Range south of the Little Nestucca River and the Grand Ronde Valley (Corkran and Thoms, 1996). The Gauldy Project Area is defined on its southern boundary by the Little Nestucca River; as such it is possible, although undocumented, that the proposed projects are within the range of the southern torrent salamander.

Pacific Fringed-tailed Bat (*Myotis thysanodes vespertinus*)

In the coastal areas of Oregon, the Pacific fringe-tailed bat roosts in buildings, rock crevices, caves, mines and under bridges near forests and grasslands. There are no buildings, or known rock crevices, caves, mines or abandon bridges within the project areas. There is however a small bridge associated with gaining access to unit #9 which, for reasons of safety, may need to be repaired or replaced; bat use of this bridge is unknown. Little is known about foraging areas, but habitats where they have been documented are salmonberry in proximity to immature conifer (Maser, 1981, p94). Three specimens captured on the Hebo Ranger District in 1971 were in alder/salmonberry habitat near immature conifer (Maser et. al., 1981). The Project Area including areas near and in some of the project areas contains both of these vegetative communities. Foraging can occur over wide areas which may include project areas.

Baird's Shrew (Sorex bairdii bairdii)

Because little information exists regarding the habitat requirements of Baird's shrew, habitat for a similar species is included in this analysis. In the past, Baird's shrew was considered a subspecies of the dusky shrew. Maser et. al. (1981) describe habitat for the dusky shrew as: mature Douglas-fir, immature conifer, alder/salmonberry, riparian alder and skunk cabbage marsh, especially along streams and seepages with logs and dense vegetation. The species is associated with Westside lowland conifer/hardwood forest and montane mixed conifer forests. It is likely that habitat for this shrew exists within the Project Area. Mature Douglas-fir habitats are distributed throughout the Project Area although commercial thinning treatments are not proposed for these mature stands. Riparian habitats which may be associated with commercial thinning units are generally excluded from treatment via "no-cut" riparian buffers.

Bufflehead (Bucephala albeola)

The bufflehead is a Region 6 Sensitive Species (USDA Forest Service, PNW, 2000b). The bufflehead is not covered under a conservation strategy and is considered migratory. The bufflehead nests near deep mountain lakes surrounded by open forested areas containing snags. Natural nesting sites are cavities in trees close to water. Breeding in Oregon occurs primarily in the central Cascade lakes region. It is very unlikely that the bufflehead breeds within the Project Area. This species winters along the Oregon coast in tide waters, bays and in the lower, slower waters of major rivers.

Harlequin Duck (Histrionicus histrionicus)

The harlequin duck inhabits rushing water in mountain streams during the nesting season and winters around partly submerged ledges of rocky seashores (Udvardy, 1977). The only harlequins known to nest in nearby coast range streams are about 30 miles up the Nestucca River, approximately 20 miles northeast of the project area. It is unlikely that harlequins nest along the portions of the Little Nestucca River or Three Rivers which abut the Project Area or that the Gauldy Project would have any impact upon harlequin ducks.

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon was removed from the Endangered Species list on August 25, 1999 (Federal Register, Vol. 64, No. 164). This species nests building ledges in urban settings, in high cliff/mountainous habitats and along sea cliffs. It migrates and winters along ocean shores where it hunts near congregations of avian prey. While the Gauldy Project Area may provide limited hunting opportunity for the peregrine falcon, there are no know suitable nesting sites within the area. Beyond a potential migrating or dispersing bird which could pass through or periodically use the area, it is unlikely that peregrine falcons use habitats within the Project Area.

b) The following describes Regional Foresters Sensitive Species that are either documented or suspected on the Siuslaw National Forest however the Project Area is located outside of their expected range or without suitable habitat therefore the project would not impact the species nor result in the elevation of their status to any higher level of concern including the need to list under the ESA. They will receive no further discussion.

Foothill Yellow-Legged Frog (*Rana boylii*)

The foothill yellow-legged frog lives in sections of low-gradient streams with exposed bedrock or rock and gravel substrates (Corkran and Thoms 1996). The species is thought to occur only in the Willamette Valley and in the southern portion of the Oregon Coast Range, although it has appeared on a 1970's Portland State University survey summary as having been found on the Hebo Ranger District (Cascade Head). Hebo District personnel have reported seeing only the red-legged frog (*Rana aurora*). If these frogs inhabit the streams within the Gauldy Project Area, their habitat would not be expected to be impacted and the actions would not impact the population or species viability to the point of elevating their status to any higher level of concern including the need to list under the ESA.

Northwestern Pond Turtle (*Clemmys mamorata mamorata*)

The northwestern pond turtle lives in ponds, marshes, streams, and irrigation ditches, typically with rocky or muddy bottoms and grown in with watercress, cattails, water lilies, or other aquatic vegetation (Stebbins 1966). The northwestern pond turtle is not thought to occur in the northern Oregon Coast Range. The gradient of the streams in the project area is too steep and the water is either too deep and fast (winter) or too shallow (summer) to provide the habitat required by pond turtles. Based on the habitat association above, this species does not have suitable habitat in the project area and would not be affected by the proposed action.

Pacific Shrew (Sorex pacificus pacificus)

The pacific shrew (Sorex pacificus pacificus) is distributed along the Oregon coast from Siltcoos River and Siltcoos Lake, Lake County, south into northwestern California in alder/salmonberry, riparian alder, and skunk cabbage marsh (Maser et. al. 1981). The entire Hebo Ranger District is considerably north of the described range for the species.

California Wolverine (*Gulo gulo*)

The California wolverine has rarely been documented in the northwestern Oregon Coast Range and it is not included in the eight mustelids that reside in coastal Oregon (Maser, 1981, p288). Wolverines no longer occur throughout much of their historic range in the western United States. In Oregon, the wolverine is typically found in open forests at higher elevations. Critical components to wolverine habitat seem to be an absence of human activity, ample big game and low road densities. There is no suitable wolverine habitat in the project area. It would not be affected by the proposed action.

Management Indicator Species (MIS)

Siuslaw National Forest Plan MIS species are those that represent a larger group or guild of species that are thought to be indicators of habitat change. The MIS species on the Siuslaw Forest include marten for mature older age stands, northern spotted owl for old growth conifer communities, pileated woodpecker for large snags and defective trees, primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) for small to medium size dead and defective trees, and ruffed grouse for hardwood and deciduous mixed habitats.

Habitat for all of these MIS species is present within the Project Area. While habitat for martens, northern spotted owl and pileated woodpeckers is present within the Project Area it is located exclusively within the older stands which are scattered amongst and around the proposed treatment units rather than within the younger stands which are proposed for treatment. Habitat for primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) which includes small to medium size dead and defective trees, and the ruffed grouse (hardwoods and deciduous mixed habitats) is present throughout the Project Area including within some of the forested stands proposed for treatments. Additional habitat for primary cavity nesters and the ruffed grouse is contained within areas not proposed for treatment such as older stands, riparian no-cut buffers and younger stands excluded from treatment for various reasons.

Survey and Manage Species

Survey Strategy Categories A and C Survey and Manage Species are those identified that require pre-disturbance surveys for all proposed habitat altering activities. The following provides information about their habitat relationships, their likelihood of occurrence in the project area and, if surveyed for, the results of the surveys and management recommendations for protection of known sites.

Vertebrates

Red Tree Vole (Abrorimus longicaudus)

The only Survey and Manage vertebrate on the Siuslaw National Forest is the red tree vole (*Abrorimus longicaudus*). Its habitat association is mature and old growth conifer forests. Based primarily upon the sizes and ages of the trees within the affected stands, there is no suitable habitat for this species within the precommercial or commercial thinning treatment units and as a result preproject surveys were unnecessary. While some of the affected roads proposed for treatment as a part of the Roads Management Project may pass through, or adjacent to, stands of suitable red tree vole habitat, due to the nature of the project it has been determined that roads management is a "non-habitat altering" action and as a result pre-project surveys were unnecessary in support of the Roads Management Project. The red tree vole would not be affected by any Gauldy alternative and will receive no further discussion.

Mollusks

During the time that most of the Gauldy project planning was occurring, there were four Survey and Manage invertebrate species (mollusks) as identified within the NWFP, and the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (dated January 2001) with potential of being located within the proposed commercial thinning project areas. They were the Puget oregonian (*Crytomastix devia*), evening fieldslug (*Deroceras hesperium*), warty jumping slug (*Hemphillia glandulosa*), and Oregon megomphix (*Megomphix hemphilli*). In general, these species are associated with the organic duff layer on the forest floor as well as with habitat types containing CWD, sword ferns and a hardwood component, especially big-leafed maple. The precommercial thinning units and roads to be impacted by the roads management project were determined not to contain habitat for S&M mollusks and consequently were not surveyed.

Survey and Manage mollusk surveys for the Gauldy commercial thinning units were conducted to protocol in and near all proposed timber sale units in the spring and fall of 2000. Approximately 1104 acres were surveyed in completing the pre-project protocol surveys in support of the Gauldy commercial thinning project. "S*urvey Protocol for Terrestrial Mollusk Species from the Northwest Forest Plan"* (Draft Version 2.0, Oct. 29, 1997) was followed for all surveys. Target species for these surveys included the four species mentioned above, as well as two additional species, the blue-grey tail-dropper *(Prophysoan coeruleum)* and the papillose tail-dropper *(Prophysoan dubium),* which were soon afterward removed from the Survey and Manage list. The blue-grey tail-dropper, papillose tail-dropper and warty jumping slug were the only target species located during these surveys. One blue-grey tail-dropper and two papillose tail-dropper sites were located during surveys while a total of approximately 363 individual warty jumping slugs were located resulting in the identification of 210 "known sites" for this species.

> *Note: The survey protocol involves two surveys of potentially suitable habitat with at least three weeks between surveys. Within every 10-acre area proposed for a ground-disturbing activity, each survey includes 20 minutes of opportunistic searching of key features (e.g., down wood, leaf litter, under sword ferns) along a survey route and two 20 minute intense surveys within fixed areas of the best habitat (i.e., one hour of survey per 10 acres).*

After the Survey and Manage mollusk surveys were complete, the Final Supplemental Environmental Impact Statement for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA and USDI, November 2000) determined that new information indicated that 72 species, in all or part of their range, were secure or otherwise did not meet the basic criteria for Survey and Manage. The Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA and USDI, January 2001) removed these species from the S&M list in all or part of their range. Two of these species, the blue-grey tail-dropper (Prophysoan coeruleum) and the papillose tail-dropper (Prophysoan dubium) had been surveyed for in or near the Gauldy project area resulting in a total of three "known sites" for these two species. As per the Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA and USDI, January 2001) guidelines to manage these known sites are no longer required; they will not be managed.

The 2001 annual review for Survey and Manage (S&M) species was completed on June 14 2002 in compliance with the 2001 Record of Decision (ROD) for amendments to the S&M, Protection Buffer, and other Mitigation Measures Standards and Guidelines (S&Gs). This review removed the requirement to manage warty jumping slug (*Hemphillia glandulosa*) known sites, however the Hebo Ranger District elected to continue plans to manage the species at the identified sites.

> *Note: The Hebo Ranger District plan to continue management of the species at the identified sites, despite the 2001 annual review removing them from the S&M list, recognizes not only the benefits of management of the warty jumping slug, but also considers the added benefits afforded by the maintenance of unthinned patches of forest and the resultant diversity in forest structure. The "Habitat Areas" are being accredited toward the goal of maintaining at least 10% of the treatment areas in unthinned patches.*

As a result of these discoveries and to manage these known warty jumping slug (*Hemphillia glandulosa*) sites in a manner as to provide protection of the physical integrity of the site thus assuring the maintenance and enhancement of the species at the site, "Habitat Areas" would be established. This would be in accordance with *Management Recommendations for Survey and Manage Terrestial Mollusks - Section number 6, Management Recommendations for Four Species of the Genus Hemphillia (version 2.0 dated October 1999).* The actual configurations of the Habitat Areas would be based on the guidance provided within the *Interim Management Recommendations for Terrestrial Mollusk - Siuslaw National Forest* (June 1999).

The Habitat Areas would be configured in such a way as to provide protection to the sites and maintain the sites' current micro-climate. Project design features such as reserving all hardwoods throughout the thinning units and minimizing disturbance to existing CWD would benefit the Habitat Areas current and future habitat quality, as well as the habitat throughout the entire thinning unit. Maintenance of the current canopy closure within the Habitat Area would help provide protection to the site's current conditions through maintaining a well-shaded forest floor in and adjacent to the known site and assuring a continued supply of leaf litter and CWD to the forest floor. If any post-harvest, burning takes place, the integrity of the Habitat Areas would be maintained by using appropriate fire protection measures. Logging equipment or logging corridors would not be permitted within the Habitat Areas. Trees would not be felled into the Habitat Areas.

In addition to the commercial thinning treatment units, the Gauldy project proposes CWD enhancement projects in areas which currently contain suitable habitat for S&M mollusks; some of the areas may be in the vicinity of the identified "known sites". The treatment areas include approximately 5 to 10 acres adjacent to unit 6, and an additional 50 to 100 acres of dense Douglas-fir dominated stands at unidentified locations within the Project Area. The identified stand approximately 5 to 10 acres in size which is in a 40-year-old stand adjacent to unit 6, would be treated with an “individual tree release” treatment to promote the development of a more diverse late-seral stage forest structure and to augment the current CWD habitat elements. It was surveyed for S&M mollusks as apart of surveys conducted for unit 6; no S&M mollusk sites were identified within the CWD enhancement project area. Within approximately 50 to 100 acres of dense Douglas-fir dominated stands which are yet to be identified but located within the Project Area, 10 to 50 trees per acre would be girdled or cut and left on site to augment existing CWD levels and encourage the development of scattered larger trees. Based upon the design features of the proposed treatment, as well as the nature of the habitat features to be impacted, the CWD enhancement projects have been determined to be potentially “habitat altering” to the point of triggering the need for pre-project surveys.

The identification of the 50 to 100 acres for CWD treatment would focus on those areas where S&M surveys were conducted but which are not planned for thinning treatment. (1104 acres surveyed - 852 acres thinned, 252 acres surveyed but not proposed for thinning). While the CWD enhancement projects have been determined to be potentially “habitat altering” to the point of triggering the need for pre-project surveys, CWD creation is not viewed as being inherently in conflict with protection of a known site. As stated guidance provided within the *Interim Management Recommendations for Terrestrial Mollusk - Siuslaw National Forest* (June 1999), “the size of the protection buffer needed is in part a function of the type of treatment prescribed.”

The CWD treatment has been designed to include feature to minimize the potential for impacts to mollusk sites. The areas selected for CWD treatment would avoid areas of concentrated known sites. Within CWD treatment units, the center of the known sites would be buffered with an approximate 30' buffer. Aspect would be considered; on southern aspects the creation of appreciable gaps would be avoided within 50' of a known site. Where determined to be beneficial, focus would be on snag creation rather than down wood creation. Trees to be felled would be felled away from known sites. Implementation of the CWD enhancement projects would be expected to reduce the average canopy closure by no more than 5 or 10%.

Landbirds

Landbirds use terrestrial habitats as opposed to being pelagic (ocean-going). They can be migrants or permanent residents and can use a wide variety of habitats, structural types and successional stages. Landbirds include Neotropical Migratory Birds (NTMBs), which are primarily hawks, songbirds and shorebirds that breed in the United States and winter in Central and South America. In recent years, there have been nationwide declines in population trends of NTMB species. Sixteen of these species are declining on National Forest lands; 10 of these 16 occur within the Gauldy Project Area, including Cooper's hawk, American kestrel, chipping sparrow, American goldfinch, mourning dove, Swainson's thrush and 4 flycatchers. Four of these species use early successional habitats, two species prefer alder-dominated habitats and three species prefer conifer-dominated habitats (McGarigal and McComb, 1993).

Roosevelt Elk and Black-tailed deer

Roosevelt elk and black-tailed deer use a wide range of habitat types. Where topographic features and/or understory vegetation exist, plantations can provide hiding cover (cover used for security) for both species. Unthinned plantations and mature forested stands provide hiding cover and thermal cover (cover used for protection from adverse weather conditions). While it still may be important, thermal cover is probably less limiting or critical within the Coast Range of northern Oregon than in other portions of these species' range, due to the mild winters and summers within the region.
Use of the Project Area, including the proposed project areas, by these species is currently considered moderate. The relatively high density of open roads within some portions of the project area, may limit the current habitat quality of the area especially for Roosevelt elk. However in general, the current quality of the habitat for deer and elk within the Project Area is considered to be good based upon the fact that areas affording hiding cover are adjacent to, and interspersed with, areas currently containing adequate browse and/or forage.

Within the Project Area, federal ownership is relatively blocked up and being managed for the development of late-seral stage habitat. As the forested stands across this landscape mature, small natural or maintained gaps and openings are expected to become increasingly important for deer and elk as foraging, browsing, calving, fawning and bedding habitat. There are two US Forest Service "elk meadows" totaling approximately 10 acres, which are maintained in cooperation with the Rocky Mountain Elk Foundation, located within the Project Area.

III. Alternatives

Alternative 1 (No action)

Under alternative 1, no commercial or precommercial thinning would occur. The roads management project would not be implemented.

Alternative 2 (Proposed action)

Commercial Thinning Project

The Gauldy Thin Project has been designed to facilitate the development of the late-seral stage habitat features within stands currently dominated by relatively dense, single-storied, mixed species stands which range in age from 30 to 45 years. Specifically, the desired condition is one in which the treated stands have an increased overall mean diameters, increased rates of tree diameter growth and crown development including large limbs and broken tops, stimulated understory shrub and herb development, diverse species composition, increased diversity of the overstory canopy, increased snags and down wood levels, greater windfirmness, and developed trees that could become future sources of high-quality snags and/or down wood.

The thinning treatments would be accomplished using largely a cable yarning system although some of the treatment units would be yarded with ground-based yarning systems; two units are currently proposed to be horse logged. Implementation of the project would require the construction of approximately 1,180 feet of temporary road. Some additional maintenance of existing roads would also be necessary including the removal of waterbird, and brushing. A total of approximately 8 miles of existing, forest roads and temporary roads would be decommissioned as a part of this project, once the roads are not needed for commercial operations.

In order to minimize the potential impacts to the spotted owl, marbled murrelet and bald eagle, activities which generate noise above the ambient forest noise level or create other disturbance (e.g., brushing or rocking of roads, road stabilization, felling, yarning, hauling, burning of slash piles etc.) would be prohibited between January 1 and July 7. While noise generating activities conducted as a part of the Gauldy Thinning project may occur as soon as July 8, activities within those units or hauling on those roads which are within approximately 0.25 miles of an occupied murrelet site or a concentration of relatively higher quality late-seral stage habitat would generally be scheduled to be implemented after August 5 (see Table 3).

Additionally, noise generating activities between July 8 and September 15 (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season) would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

Table 3. Unit specific seasonal restrictions to help minimize the potential for impacts to spotted owls, marbled murrelets and bald eagles

Units	Start Date for Road Construction, Felling and/or Yarding	Potential Log Haul Period*
9, 13, 14, 15	July 8	August 6 to December 31
4, 6, 7, 8, 10, 11, 12	August 6	August 6 to December 31
1, 2, 3, 5, 18, 19, 20	July 8	July 8 to December 31

* Depending upon weather conditions, log haul period could likely end by approximately October 31st to avoid excessive road damage. Relative to the analysis of the impacts to various wildlife species, the annual haul period was assumed to continue until December 31.

The project includes a number of design features which would help enhance the development of some late-seral stage habitat features and promote an increase in the general structural diversity of the areas treated and the Project Area. Some of these design features include but are not limited to the following:

1. The project would occur within 18 irregularly shaped treatment units scattered throughout the Project Area and would emphasize retaining the larger-diameter conifers even at the expense of spacing. Crown closure after project implementation would be somewhat variable depending upon the unit-specific silvicultural prescription and spacing of the reserve trees however, the average crown closure immediately after timber harvest and CWD creation is expected to range from approximately 60% to 65%.
2. The maintenance of unthinned forest patches within and adjacent to the treatment units would result in an increased horizontal diversity of the overstory and understory development within the Project Area. Stands of a similar age and condition as the stands being treated would be maintained unthinned as a result of the protection of known Survey and Manage sites, maintenance of no-cut riparian buffers, and areas excluded from treatment for lack of access or logging infeasibility.
3. All hardwoods would be retained with the exception of those within landing or road clearing limits. Those needing to be felled for safety concerns or corridor construction would be retained on site for CWD.
4. Trees felled and intended to be retained on site for down woody debris would be felled parallel to the contour of the slope where possible.
5. Green trees with characteristics desirable to wildlife (broken or forked tops, hollow cavities, large limbs), would be expected to be retained within the stand in a proportion comparable to the pre-treatment stand condition.
6. All existing snags, with the exception of those necessary to cut for reasons of safety, and all existing down wood would be retained and protected to the greatest extent possible.
7. Existing conifer advanced regeneration would be retained. Advanced regeneration is generally defined as “non-merchantable” trees, trees less than approximately 6 inches DBH.
8. When a thinning treatment unit abuts a larger stand of mature forest, a narrow strip of unthinned forest approximately the width of three current tree spacing would be maintained where possible. This would most notably occur in conjunction with units 4, 6, and 12; it would not be done when an existing road is located between the treatment unit and older stand. This unthinned strip would be expected to serve several purposes including increasing the general diversity of tree spacing and overstory crown development, providing a future source of natural snag and down wood recruitment, and a buffer to further minimize some of the potential negative impacts of the thinning and/or risk of logging damage to the older stand. This design feature could also help reduce the number of trees within adjacent stands of mature forest being determined to be safety hazards and consequently felled.
9. Where appropriate, red cedar would be planted in forest gaps and identified clearings to increase the species diversity within the area.
10. Trees within adjacent mature stands which are determined to potentially suitable as marbled murrelet nest trees would not be used as tailholds.
11. The creation of snag-topped trees in treatment units 8 and 18 would augment existing CWD and promote the development of trees with characteristics desirable to wildlife such as broken or dead tops, hollow cavities, and/or large limbs.
12. In addition to the 18 treatment units, a 40-year-old stand approximately 5 to 10 acres in size which is adjacent to unit 6 and of a similar age and condition as the stand being thinned, would be treated with an “individual tree release” treatment to augment existing CWD and promote the

development of late-seral stage forest structure. Focusing on the dominate trees within the stand, approximately 12 trees per acre (or ideally pairs of trees growing within 4 feet of each other), would be release by girdling or felling competing trees within a distance of approximately 30 to 35 feet. If power tools are used to implement this design feature, work would be accomplished outside of the owl and murrelet breeding seasons (March 1 to September 30).

13. Within approximately 50 to 100 acres of dense Douglas-fir dominated stands which are not within the 18 units proposed for thinning treatment, 10 to 50 trees per acre would be girdled or cut and left on site to augment existing CWD levels and encourage the development of scattered larger trees. If power tools are used to implement this design feature, work would be accomplished outside of the owl and murrelet breeding seasons (March 1 to September 30).

The Precommercial Thinning Project

The proposed precommercial thinning (PCT) would take place within approximately 1,658 acres of 7 to 15-year-old plantations which are distributed throughout the Project Area. Silvicultural prescriptions of the proposed PCT units have been designed to promote the development of late-seral stage habitat, minimize impacts to listed fish, provide for adequate shade and prevent any potential adverse affects to stream channel or water quality conditions. In general the stands would be managed by thinning to a density of 75 to 200 conifer trees per acre. Cut trees would be left on site. PCT would be accomplished from October 1 through February 29.

The Road Stabilization Projects

In response to decreased road maintenance funding and to reduce the risk to aquatic resources, the Road Stabilization Project proposes to reduce motorized access and alter the current maintenance classification level of many of the forest roads within the Project Area. Approximately 30 miles of existing forest roads, currently at Maintenance Level 2, would be stabilized and closed to vehicle travel, but retained on the Forest Roads System (Maintenance Level 1). Before closure, these roads would be stabilized, which may include installing waterbars and/or cleaning of culverts and ditches; all entrances would be blocked to vehicle access. Approximately 20 miles of forest roads would be decommissioned; decommissioning may include removing culverts, scarification of the road surface, blocking entrances and/or some side-cast pullback.

The Road Stabilization project has been designed to minimize the potential impacts to spotted owls, marbled murrelets and bald eagles. Activities which generate noise above the ambient noise level would be prohibited between January 1 and July 7. Additionally, noise generating activities between July 8 and September 15 (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season) would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

While noise generating activities conducted as a part of the Road Stabilization project may occur as soon as July 8, as with the Gauldy Thinning project, activities on those roads or road segments which are within 0.25 miles of an occupied murrelet site or a concentration of relatively higher quality, late-seral stage habitat would generally be scheduled to be implemented after August 5.

Alternative 3

This alternative proposes alternative ways to maintain road access to private land.

Alternative 4

This alternative proposes that only Forest Roads 1500 and 1533 would be maintained open for public travel. They would be maintained at Maintenance Level 2 which is for high clearance vehicles only. The remaining open Forest and Unclassified Roads would be decommissioned or closed to vehicle travel, and remain on the Forest Road System as they are needed for future projects.

IV. Effects of the Alternatives on Wildlife Species Federally Listed as Threatened or Endangered, Designated Critical Habitat, Species Identified as Regional Forester Sensitive, Management Indicator Species, Survey and Manage Species, Landbirds, and Cumulative Effects.

Federally Listed Species and their Designated Critical Habitat

Section 7 of the ESA directs each Federal agency to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat. The Act also directs each Federal agency to confer or consult with the appropriate Secretary on any action that is likely to jeopardize or affect the continued existence of any species or its habitat.

All of the alternatives would have *no effects* upon the following threatened (T), endangered (E), or proposed (P) species found within the boundaries of the Siuslaw National Forest - Hebo Ranger District due to lack of suitable habitat in the project area. There will be no further discussion of these species.

Oregon silver spot butterfly	T	Speveria zerene hippolyta
Western snowy plover	T	Charladies alexandrinus nivosus
Brown pelican	E	Pelecanus occidentalis

The Final Rule for Designation of Critical Habitat for northern spotted owls was published in the Federal Register on January 15, 1992. Because the project area is not located within designated critical habitat for the northern spotted owl, all of the alternatives would have *no effect* upon spotted owl critical habitat.

The following species listed as threatened under the ESA have suitable habitat in the project area. This BE addresses the effects to these species by each alternative of the Gauldy Project.

Marbled murrelet	Brachyramphus marmoratus
Northern spotted owl	Strix occidentalis caurina
Northern bald eagle	Haliaeetus leucocephalus

The Final Rule for Designation of Critical Habitat for marbled murrelet was published in the Federal Register on May 24, 1996. Some of the proposed project areas are located within the boundaries of marbled murrelet Designated Critical Habitat Unit OR-02-b. This EA addresses the effects of the Gauldy Project alternatives upon murrelet Designated Critical Habitat.

On March 26, 2002 a field trip was conducted to the Gauldy project for USFWS biologists Dave Clayton and Bridget Tuerler. In May 2002 the Forest Service requested informal and formal consultation with the Wildlife Service pursuant to section 7 of the Endangered Species Act. The Service issued a biological opinion [FWS reference: 1-7-02-F-744] that supported the determinations in the Gauldy Thin and Road Stabilization Projects Biological Assessment dated May 22, 2002.

Effects of the No Action Alternative

Under the No Action Alternative, no commercial or precommercial thinning would occur and the roads management project would not be implemented. The riparian planting would not occur. The identified positive and negative impacts of implementing the proposed actions upon ESA listed species and/or their habitat would not occur. The forested stands proposed for commercial or precommercial thinning would be expected to continue to naturally develop into late-seral habitat over time although due to increasing competition for site resources the trees would grow at a decelerating rate, and crown ratios would be expected to decrease thus taking considerably more time to exhibit the qualities desirable for late seral habitat relative to the Alternative 2. Table 5 of Biological Assessment (USDA, May 2002) displays some habitat characteristics of the stands proposed for commercial thinning after 30 years with and without thinning.

The No Action Alternative would be of *No Effect* upon the marbled murrelet and northern spotted owl and their designated critical habitats, and the bald eagle.

Effects of Commercial Thinning Project

As per the ESA, consultation with the USFWS on the Gauldy Commercial Thinning Project has been completed; a project specific Biological Assessment (BA) dated May 22, 2002 (USDA, May 2002) was submitted to USFWS and they issued a Biological Opinion dated July 25, 2002 (USFWS reference 1-7-02-F-744). Table 4 contains a summary of ESA determinations of effects for the Gauldy Commercial Thinning Project.

Marbled Murrelet

Designated Critical Habitat The project area is located within the boundaries of marbled murrelet Designated Critical Habitat unit OR-02-b, however the thinning treatment units, being less than one-half site potential tree tall, are not Designated Critical Habitat. Although expected to be few in number (less than 10), it is possible that individual green trees or snags within adjacent stands of suitable murrelet habitat which are designated as murrelet Critical Habitat would need to be felled as safety hazards. It is also possible that some of these trees would contain potentially suitable murrelet nesting platforms, or be adjacent to and providing cover for potentially suitable nest trees. Therefore the commercial thinning project *May Affect* marbled murrelet Designated Critical Habitat as a result of the potential for individual trees within adjacent stands of Designated Critical Habitat being identified as safety hazards and consequently felled. This potential has been minimized by the project design feature of maintaining an unthinned strip of trees when a thinning treatment unit abuts a larger stand of mature forest.

Disturbance

All of the proposed thinning units and large portions of the associated haul routes are within 0.25 miles of suitable murrelet habitat. There are an estimated 2,403 acres of suitable murrelet habitat within 0.25 miles of a proposed thinning unit and/or associated haul route. None of this suitable habitat located within the vicinity of the proposed projects is considered to be currently surveyed to protocol. At least two of the proposed units and portions of the main haul route are directly adjacent to occupied stands of suitable marbled murrelet habitat; activities which would raise the ambient noise level within 0.25 miles of these occupied stands has generally been prohibited during the critical breeding season.
No activities which generate noise above the ambient level would be conducted prior to July 8 of each calendar year. Noise generating activities between July 8 and September 15 (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season) would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

Although the operating seasons of the various treatment units have been scheduled to minimize the potential for impacts to nesting murrelets, there would be some potential to disturb murrelets from noise disturbance resulting from activities within the treatment units and along the haul route. Since there is suitable murrelet habitat within 0.25 miles of the treatment units and along the haul route, and some harvest operations and hauling may occur during the breeding season there is potential for impacts to nesting murrelets as a result of disturbance.

While noise generating activities associated with the commercial thinning may occur as soon as July 8, in general, those activities which are within the vicinity of an occupied murrelet site or a concentration of higher quality unsurveyed suitable habitat would generally be scheduled to be implemented after August 5. This could result in up to approximately 1000 acres of unsurveyed suitable murrelet habitat being disturbed during the later part of the murrelet critical breeding period (July 8 - August 5) while an additional 1403 acres could be disturbed during the non-critical breeding season (August 6 - September 15).

Those activities which would occur in the later part of the murrelet critical breeding period (July 8 - August 5), *May Affect - Likely to Adversely Affect* the murrelet. Those activities which would occur during the murrelet non-critical breeding period (August 6 - September 15), *May Affect - Not Likely to Adversely Affect* the murrelet.

Habitat Modification

The commercial thinning project proposes to thin approximately 852 acres of 30- to 45-year-old forest which is distributed in 18 treatment units across 15 sections. None of these treatment units contain trees with potentially suitable murrelet nesting platforms, nor are any of the units greater than one half site potential tree tall. As such, the actual thinning of the treatment units is expected to have no impact upon murrelet habitat.

Many of the proposed treatment units and haul routes are intermingled with stands which are suitable murrelet habitat. At least two of the proposed units and portions of the main haul route are directly adjacent to occupied stands of suitable marbled murrelet habitat. Although expected to be few in number (10 or less), it is possible that individual green trees or snags within these adjacent stands of suitable murrelet habitat would need to be felled as safety hazards. It is also possible that some of these trees would contain potentially suitable murrelet nesting platforms, or be adjacent to and providing cover for potentially suitable nest trees. Therefore the Commercial thinning project *May Affect - Likely to Adversely Affect* the marbled murrelet as a result of habitat modification, based upon the potential for up to 10 individual trees within adjacent stands of suitable habitat being identified as safety hazards and consequently felled.

In the long-term, the forested environment is expected to be more structurally diverse, with larger trees exhibiting much greater limb development, and consequently better murrelet habitat than if no treatment were implemented (see table 5 of Biological Assessment - USDA, May 2002). The variable spaced thinning, including gaps in the canopy, would encourage individual tree limbs to lengthen and enable the tree crowns to lengthen as lower limbs are retained. If the proposed thinning treatment were not carried out, the stands within the project area would be expected to continue to naturally develop into better murrelet habitat over time although due to increasing competition for site resources the trees would grow at a decelerating rate, and crown ratios would be expected to decrease thus taking considerably more time to exhibit the qualities desirable for higher quality murrelet habitat.

Northern Spotted Owl

Disturbance Although there are no known active owl sites in the vicinity of the proposed project area, there is an estimated 2,403 acres of unsurveyed suitable spotted owl habitat within 0.25 miles of the proposed thinning units and/or the associated haul routes. Based upon the project design features, there is potential for disturbance of this unsurveyed suitable habitat during the non-critical owl breeding period (July 7 - September 30). This potential for disturbance *May Affect but is Not Likely to Adversely Affect* the spotted owl.

Habitat Modification Including both spotted owl dispersal habitat and suitable habitat, approximately 74% (9,404 acres) of the federal land within the Project Area is currently in a condition to facilitate owl dispersal. The commercial thinning project would thin approximately 11% of this federal habitat.

Considering all ownerships and including both owl dispersal habitat and suitable habitat, approximately 60% (12,304 acres) of the land within the Project Area is currently in a condition to facilitate owl dispersal. The commercial thinning project would thin approximately 7% of this total habitat. Post-harvest the condition of the habitat throughout the Project Area is expected to facilitate owl dispersal.

The commercial thinning project proposes to thin 852 acres of spotted owl dispersal habitat. Some of these stands are probably poor quality dispersal habitat based upon stand age and the extreme high density of trees which could inhibit an owl's ability to fly through portions of the stand. The proposed action is expected to impact this dispersal habitat in the near term by removing trees, primarily from the smaller size classes, thereby reducing the average canopy closure from the current 85 to 95 percent, to an expected average of 60 to 65 percent. At the completion of the thinning, the forest conditions within the treatment units are expected to function as dispersal habitat for the spotted owl. In addition, to impacting canopy closure, project implementation is expected to result in felling or knocking over a number of the existing smaller snags. Project design features include measures to create snags and/or down logs in a number of selected locations within selected treatment units as well as in other identified areas within the Project Area.

Although there are no known active owl sites in the vicinity of the proposed project area, many of the proposed treatment units and haul routes are intermingled with stands which are unsurveyed suitable spotted owl habitat. Although expected to be few in number (10 or less), it is possible that individual green trees or snags within these adjacent stands of suitable habitat would need to be felled as safety hazards. It is also possible that some of these trees would be suitable as spotted owl nest trees.

In the long-term (20 or 30 years +) the forested environment is expected to be more structurally diverse and consequently better owl habitat than if no treatment were implemented (see table 5 of Biological Assessment - USDA, May 2002). The variable spaced thinning, including gaps in the canopy and dense patches which would be reserved from thinning would result in differing rates of growth for overstory and understory trees and understory shrub species. Further enhancement of the future structural and species diversity with the treated stands would be accomplished by introducing some western redcedar, a shade tolerant species into some of the stands. Larger trees with longer more developed green crowns would be obtained sooner than would occur without treatment. If the proposed thinning and CWD creation treatment were not carried out, the stands within the project area would be expected to continue to naturally develop into better owl habitat over time. However, due to increasing competition for site resources the trees would grow at a decelerating rate, thus taking considerably more time to reach the sizes desirable for higher quality habitat and potential owl nest trees or high quality snags and down logs.

The commercial thinning project *May Affect - Not Likely to Adversely Affect* the spotted owl based on habitat modification, because of the potential short-term impacts to 852 acres of spotted owl dispersal habitat, the potential for needing to fell up to 10 hazard trees located within suitable owl habitat adjacent to the treatment units or haul routes, and the expected beneficial long-term impacts of improved habitat in a shorter period of time than would occur without treatment.

The identified potentially negative impacts to spotted owl resulting from habitat modification are expected to be minor based upon the nature of the proposed treatments and the quality and quantity of habitat within the Project Area; nest trees are not believed to be limiting. Approximately 34% (4,339 acres) of the federal land within the Project Area is considered to be suitable habitat for the spotted owl. Considering all ownerships, approximately 23% (4,739 acres) of the land within the Project Area is considered to be suitable habitat for the spotted owl. Including both spotted owl dispersal habitat and suitable habitat, approximately 74% (9,404 acres) of the federal land within the Project Area is currently in a condition to facilitate owl dispersal and the commercial thinning project would thin only approximately 11% of this federal habitat. Additionally, considering all ownerships and including both owl dispersal habitat and suitable habitat, approximately 60% (12,304 acres) of the land within the Project Area is currently in a condition to facilitate owl dispersal and the commercial thinning project would thin only approximately 7% of this total habitat.

Bald Eagle

Disturbance The nearest known bald eagle nest is located on private land approximately 2 miles from the nearest thinning treatment unit. There are an estimated 107 acres of suitable bald eagle habitat within 0.25 miles of a proposed thinning unit and/or an associated haul route. Activities which generate noise above the ambient level may be implemented after July 7.

The commercial thinning Project *May Affect Not Likely to Adversely Affect* the bald eagle based upon the potential for disturbance. The action is not likely to adversely affect the bald eagle based upon the fact that eagle nests tend to be very visible and there are no known nests within the area (within 0.25 miles or 0.5 miles line-of-sight distance). If a new bald eagle nest were discovered, any activity within 0.25 miles or 0.5 miles line-of-sight distance would immediately be evaluated for potential effects and restricted to prevent disturbances. If foraging or roosting eagles are disturbed as a result of the thinning activities they would be expected to simply move a short distance and forage or roost in other areas containing suitable habitat.

Habitat Modification Based upon design features of the proposed commercial thinning project, there are no impacts expected to the elements of bald eagle habitat. Therefore, the commercial thinning project has been determined to be of *No Effect* upon the bald eagle based upon habitat modification.

Table 4 - Summary of ESA Determinations of Effects for the Gauldy Commercial Thinning Project	
Marbled Murrelet	Activities occurring July 8 - August 5 *May Affect - Likely to Adversely Affect*
	Activities occurring August 6 - September 15 *May Affect - Not Likely to Adversely Affect*
Marbled Murrelet Critical Habitat	*May Affect*
Northern Spotted Owl	*May Affect - Not Likely to Adversely Affect*
Northern Spotted Owl Critical Habitat	*No Effect*
Northern Bald Eagle	*May Affect - Not Likely to Adversely Affect*

Effects of Precommercial Thinning Project

Table 5 contains a summary of ESA determinations of effects for the Gauldy Precommercial Thinning Project upon the marbled murrelet and northern spotted owl and their designated critical habitats, and the bald eagle.

The implementation of the PCT project has been scheduled to be accomplished at such a time as to minimize the potential for adverse impacts to a wide range of wildlife species; it will be implemented from October 1 through February 29.

Marbled Murrelet

Designated Critical Habitat Portions of the Gauldy PCT Project are located within the boundaries of marbled murrelet Designated Critical Habitat Unit OR-02-b, however due to the nature of the habitats impacted by PCT; it would not impact any constituent elements of Critical Habitat. Therefore, the PCT project would be of *No Effect* upon marbled murrelet critical habitat.

Disturbance Although occupied and/or unsurveyed suitable murrelet habitat is located within 0.25 miles of young plantations proposed for PCT, the PCT project is of *No Effect* upon marbled murrelet based upon the potential for disturbance because it is scheduled to be implemented outside of the critical and non-critical murrelet breeding seasons.

Habitat Modification Based upon the nature of the habitats impacted by the proposed PCT Project there are no impacts expected to the elements of marbled murrelet habitat. Therefore, the PCT has been determined to be of *No Effect* upon the murrelet based upon habitat modification.

Northern Spotted Owl

Disturbance Although unsurveyed suitable spotted owl habitat is located within 0.25 miles of young plantations proposed for PCT, the PCT project is of *No Effect* upon spotted owl based upon the potential for disturbance because it is scheduled to be implemented outside of the critical and non-critical owl breeding seasons.

Habitat Modification Based upon the nature of the habitats impacted by the proposed PCT project there are no impacts expected to the elements of spotted owl habitat. Therefore, the PCT has been determined to be of *No Effect* upon the spotted owl based upon habitat modification.

Bald Eagle

Disturbance The implementation of the PCT project has been scheduled to be accomplished from October 1 through February 29. With the bald eagle breeding season being from January 1 to August 31 a portion of the PCT project could be occurring within the first two months of the eagle breeding season. Although the nearest known bald eagle nest is located approximately 0.9 miles from a young plantation to be thinned, there are approximately 370 federal acres and up to approximately 120 acres of non-federal acres of suitable bald eagle habitat within 0.25 miles of a young plantation proposed to be treated by PCT.

Although the operating seasons of the PCT treatment have been scheduled to minimize the potential for impacts to nesting murrelets and spotted owls, there would be some potential to disturb bald eagles from noise disturbance resulting from activities within the PCT treatment units during the first two months of the eagle breeding season. Those PCT activities which would occur outside of the bald eagle breeding period (October 1 - December 31), would be of *No Effect* upon the bald eagle. Those activities which would occur during the first two months of the eagle breeding season (January 1 - February 29), *May Affect - Not Likely to Adversely Affect* the bald eagle.

Habitat Modification Based upon the nature of the habitats to be impacted by the proposed PCT Project there are no impacts expected to the elements of bald eagle habitat. Therefore, the PCT has been determined to be of *No Effect* upon the bald eagle based upon habitat modification.

Table 5 - Summary of ESA Determinations of Effects for the Gauldy Precommercial Thinning Project	
Marbled Murrelet	*No Effect*
Marbled Murrelet Critical Habitat	*No Effect*
Northern Spotted Owl	*No Effect*
Northern Spotted Owl Critical Habitat	*No Effect*
Northern Bald Eagle	Activities occurring October 1 - December 31 *No Effect*
	Activities occurring January 1 - February 29 *May Affect - Not Likely to Adversely Affect*

As per the ESA, consultation with the USFWS on the Gauldy Precommercial Thinning Project has been completed; the project has been included in the Programmatic Consultation on FY 2002-2003 projects within the North Coast Province which may disturb Bald Eagle, northern spotted owls and marbled murrelets [USFWS reference 1-7-02-F-422].

Effects of the Road Stabilization Projects

Table 6 contains a summary of ESA determinations of effects for the Gauldy Road Stabilization Project upon the marbled murrelet and northern spotted owl and their designated critical habitats and the bald eagle.

Marbled Murrelet

Designated Critical Habitat Portions of the Gauldy Road Stabilization Project are located within the boundaries of marbled murrelet Designated Critical Habitat Unit OR-02-b, however due to the nature of the road stabilization project it is not expected to impact any constituent elements of Critical Habitat. Therefore, the commercial thinning project would be of *No Effect* upon marbled murrelet critical habitat.

Disturbance There are an estimated 2,257 acres of occupied or unsurveyed suitable murrelet habitat within 0.25 miles of a road or road segment proposed for stabilization.

Road stabilization activities which generate noise above the ambient noise level would be prohibited between January 1 and July 7. Additionally, noise generating activities between July 8 and September 15 (coincides partially or wholly with both the marbled murrelet critical and non-critical breeding season) would be restricted to the daily time period between two hours after sunrise to two hours before sunset.

While noise generating activities conducted as a part of the Road Stabilization project may occur as soon as July 8, activities on those roads or road segments which are within the vicinity of an occupied murrelet site or a concentration of higher quality unsurveyed suitable habitat would generally be scheduled to be implemented after August 5. This could result in up to approximately 800 acres of unsurveyed suitable murrelet habitat being disturbed during the later part of the murrelet critical breeding period (July 8 - August 5) while an additional 1457 acres could be disturbed during the non-critical breeding season (August 6 - September 15).

Those activities which would occur as a part of the Gauldy Road Stabilization Project within the later part of the murrelet critical breeding period (July 8 - August 5), *May Affect - Likely to Adversely Affect* the murrelet. Those activities which would occur during the murrelet non-critical breeding period (August 6 - September 15), *May Affect - Not Likely to Adversely Affect* the murrelet.

In addition to the potential impacts discussed above, the road stabilization project is expected to reduce motorized access into large portions of the Project Area. In terms of disturbance, this would be expected to have a long-term beneficial impact to marbled murrelets by reducing the amount of human activity and associated noise within the vicinity of suitable habitat.

Habitat Modification Based upon the nature of the proposed Road Stabilization Project there are no impacts expected to the elements of marbled murrelet habitat. Therefore, the Road Stabilization Project has been determined to be of *No Effect* upon the murrelet based upon habitat modification.

Northern Spotted Owl

Disturbance Although there are no known active owl sites in the vicinity of the proposed project area, there are an estimated 2,257 acres of unsurveyed suitable spotted owl habitat within 0.25 miles of a road or road segment which is proposed for stabilization.

Road stabilization activities which generate noise above the ambient noise level would be prohibited between January 1 and July 7. While noise generating activities conducted as a part of the Road Stabilization project may occur as soon as July 8, activities on those roads or road segments which are within the vicinity of higher quality unsurveyed suitable habitat would generally be scheduled to be implemented after August 5.

The Gauldy Road Stabilization Project would result in a *May Affect - Not Likely to Adversely Affect* the spotted owl because of the potential impacts resulting from disturbance within 0.25 miles of a road or road segment proposed for stabilization during the non-critical breeding season (July 8 to September 30).

In addition to the potential impacts discussed above, the road stabilization project is expected to reduce motorized access into large portions of the Project Area. In terms of disturbance, this would be expected to have a beneficial impact to spotted owls by reducing the amount of human activity and associated noise within the vicinity of suitable habitat.

Habitat Modification Based upon the nature of the proposed Road Stabilization Project there are no impacts expected to the elements of spotted owl habitat. Therefore, the Road Stabilization Project has been determined to be of *No Effect* upon the spotted owl based upon habitat modification.

Bald Eagle

Disturbance Road management activities which generate noise above the ambient noise level would be prohibited between January 1 and July 7, however activities which generate noise above the ambient level may be implemented after July 7.

Although the nearest known bald eagle nest is located approximately 2 miles from the nearest road segment to be stabilized, there are 163 acres of suitable bald eagle habitat within 0.25 miles of a road or road segment proposed for stabilization.

Based upon these facts, the road stabilization project *May Affect Not Likely to Adversely Affect* the bald eagle based upon the potential impacts resulting from disturbance.

Habitat Modification Based upon the nature of the proposed Road Stabilization Project there are no impacts expected to the elements of bald eagle habitat. Therefore, the Road Stabilization Project has been determined to be of *No Effect* upon the bald eagle based upon habitat modification.

Table 6 - Summary of ESA Determinations of Effects for the Gauldy Road Stabilization Project

Marbled Murrelet	Activities occurring July 8 - August 5 *May Affect - Likely to Adversely Affect*
	Activities occurring August 6 - September 15 *May Affect - Not Likely to Adversely Affect*
Marbled Murrelet Critical Habitat	*No Effect*
Northern Spotted Owl	*May Affect - Not Likely to Adversely Affect*
Northern Spotted Owl Critical Habitat	*No Effect*
Northern Bald Eagle	*May Affect - Not Likely to Adversely Affect*

As per the ESA, consultation with the USFWS on the Gauldy Road Stabilization Project has been completed; a project specific Biological Assessment (BA) dated May 22, 2002 was been submitted to USFWS and they issued a Biological Opinion dated July 25, 2002 (USFWS reference 1-7-02-F-744).

Regional Forester Sensitive Species

The following describes the effects of the alternatives upon those Regional Forester's Sensitive Species that are documented or suspected on the Siuslaw National Forest, and the Project Area is located within their range of distribution and contains suitable habitat.

Under the No Action Alternative, no commercial or precommercial thinning would occur and the roads management project would not be implemented. The identified positive and negative impacts of implementing the proposed actions upon Regional Foresters Sensitive Species would not occur.

None of the impacts associated with either of the alternatives is expected to result in a potential elevation of any of their statuses to any higher level of concern including the need to list under the ESA.

Effects of Alternative 2.

Columbia Torrent Salamander (*Rhyacotriton kezeri*)

All of the suitable torrent salamander habitat within the vicinity of the proposed commercial thinning units is contained within the riparian zones of the Riparian Reserves. The commercial thinning project has been designed to include measures to assure the restoration or maintenance of the Aquatic Conservation Objectives and to minimize the potential for adverse impacts. The most important of these measures includes the placement and configurations of the units themselves. In general the treatment units have a ridge top location, often avoiding areas with high concentrations of riparian areas. Riparian areas located in proximity to a commercial thinning treatment unit are protected with no harvest buffers. These buffers would be expected to protect the physical integrity of habitat and minimize any potential for siltation, or impacts to water temperature and the cool microclimate of the riparian zone and thereby protect any suitable torrent salamander habitat within the vicinity of the proposed commercial thinning units. Like the commercial thinning project, CWD treatments have been designed to have minimal impacts upon aquatic resources and to help meet the ACS objectives, these design features would also help assure that the treatments would not impact the torrent salamander or its habitat resulting in a potential elevation of their status to any higher level of concern.

The design features of the PCT treatments to minimize impacts to listed fish provide for adequate shade and prevent any potential adverse affects to stream channel or water quality conditions. These measures also are expected to also prevent any potential adverse affects upon torrent salamanders or their habitat. Additionally, in general PCT units do not extend down to the edge of perennial streams based on the fact that the original clearcut harvest design features provided for buffers along the sides of larger streams.

Some portions of the roads management project, specifically culvert work, could result in a temporary disturbance and minor alterations in torrent salamander habitat; design features to minimize impacts to listed fish provide for adequate shade and prevent any potential adverse affects to stream channel or water quality conditions will minimize any potential impacts upon torrent salamanders and/or their habitat.

Southern Torrent Salamander (*Rhyacotriton variegates*)

The Gauldy Project Area is defined on its southern boundary by the Little Nestucca River; as such it is possible, although undocumented, that the proposed projects are within the range of the southern torrent salamander.

Should the species occur within the project area, impacts resulting from the alternatives would be similar to those described for the Columbia torrent salamander.

Pacific Fringed-tailed Bat (*Myotis thysanodes vespertinus*)

While there are no buildings, or known rock crevices, caves, mines or abandon bridges within the project areas, the Project Area including areas near and in some of the projects contains habitats which could be used by this species. Bat foraging can include wide areas and can not be discounted as possibly occurring within or near the project areas. Additionally, there is a small bridge associated with gaining access to unit #9 which, for reasons of safety, may need to be repaired or replaced; bat use of this bridge is unknown.

Alternative 2 would alter habitats that this species could forage over, however the planned alteration would help restore natural ecosystem processes, promote historic habitats and would occur during daylight hours. The potential repair or replacement of the small bridge associated with gaining access to unit #9 could temporarily displace individual bats as the bridge work is being conducted if bats are using this structure for a day or night roost. Due to the limited impact from habitat change or disturbance, the proposed project may impact the individuals of the species but would not be expected result in a potential elevation of any of their statuses to any higher level of concern including the need to list under the ESA.

Bairds Shrew (*Sorex bairdii bairdii*)

Because little information exists regarding the habitat requirements of Baird's shrew, habitat for a similar species is included in this analysis. In the past, Bairds shrew was considered a subspecies of the dusky shrew. Maser et. al. (1981) describe habitat for the dusky shrew as: mature Douglas-fir, immature conifer, alder/salmonberry, riparian alder and skunk cabbage marsh, especially along streams and seepages with logs and dense vegetation. The species is associated with Westside lowland conifer/hardwood forest and montane mixed conifer forests. It is likely that habitat for this shrew exists within the project area and that individual shrews would be impacted by project activities; however, it is unlikely that project implementation would result in a potential elevation of any of their statuses to any higher level of concern including the need to list under the ESA.

Bufflehead (*Bucephala albeola*)

The bufflehead is a Region 6 Sensitive Species (USDA Forest Service, PNW, 2000b). The bufflehead is not covered under a conservation strategy and is considered migratory. The bufflehead nests near deep mountain lakes surrounded by open forested areas containing snags (Csuti et al. 1997). Natural nesting sites are cavities in trees close to water. Breeding in Oregon occurs primarily in the central Cascade lakes region and it is very unlikely that the bufflehead breeds within the Project Area.

It is unlikely that the Gauldy Project would have any impact upon the bufflehead; it would not result in an elevation of their status to any higher level of concern including the need to list under the ESA.

Harlequin Duck (*Histrionicus histrionicus*)

It is unlikely that harlequins nest along the portions of the Little Nestucca River or Three Rivers which abut the Project Area or that the Gauldy Project would have any impact upon harlequin ducks. The seasonal restrictions designed into the Gauldy Project would further serve to reduce the likelihood of impact as it largely eliminates the breeding season. The Gauldy Project would not be expected to result in an elevation of their status to any higher level of concern including the need to list under the ESA.

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon was removed from the Endangered Species list on August 25, 1999 (Federal Register, Vol. 64, No. 164). This species nests building ledges in urban settings, in high cliff/mountainous habitats and along sea cliffs. It migrates and winters along ocean shores where it hunts near congregations of avian prey. While the Gauldy Project Area may provide limited hunting opportunity for the peregrine falcon, there are no know suitable nesting sites within the area. Beyond a potential migrating or dispersing bird which could pass through or periodically use the area, it is unlikely that peregrine falcons use habitats within the Project Area.

Implementation of the Gauldy project would improve habitats used by many potential prey species, and would improve opportunities for hunting during migration and winter periods. While implementation would result in disturbance where this species may hunt, all potential disturbances would be very limited in location and duration, and therefore not constitute an impact that would result in an elevation of their status to any higher level of concern including the need to list under the ESA.

Management Indicator Species (MIS)

Siuslaw National Forest Plan MIS species are those that represent a larger group or guild of species that are thought to be indicators of habitat change. The MIS species on the Siuslaw Forest include marten for mature older age stands, northern spotted owl for old growth conifer communities, pileated woodpecker for large snags and defective trees, primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) for small to medium size dead and defective trees, and ruffed grouse for hardwood and deciduous mixed habitats.

Habitat for all of these MIS species is present within the Project Area. While habitat for martens and northern spotted owl is present within the Project Area it is located exclusively within the older stands which are scattered amongst and near the proposed treatment units rather than within the younger stands that are proposed for treatment. While pileated woodpeckers are largely associated with mature conifer habitat, especially for nesting, they will readily use younger stands, or even recent clearcuts for foraging if suitable CWD is present. The highest quality pileated woodpecker habitat within the Project Area is located within the area's mature conifer or mixed stands. Habitat for primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) which includes small to medium size dead and defective trees, and the ruffed grouse (hardwoods and deciduous mixed habitats) is present throughout the Project Area including within the forested stands proposed for treatments. Additional habitat for primary cavity nesters and the ruffed grouse is present within areas not proposed for treatment such as older stands, riparian no-cut buffers and younger stands excluded from treatment for various reasons.

While the proposed action would not take place within old-growth or mature conifer habitat or stands containing large snags and defective trees, the proposed action would be expected to have a long-term beneficial impact upon marten, northern spotted owl and pileated woodpecker habitat relative to the "no-action" alternative. This is based upon the fact that the action alternative is expected to place treated stands on a trajectory which would result in development of late-seral stage habitat features sooner than would occur without treatment. This would serve to help "block-up" the surrounding older forest stands or mature habitat resulting in less fragmentation and a greater quantity and quality of interior mature forest habitat within the Project Area. There are no short-term negative impacts to marten, northern spotted owl and pileated woodpecker habitat expected to result from the action alternative because treatments are proposed only for younger stands.

Habitat for primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) which includes small to medium size dead and defective trees, and the ruffed grouse (hardwoods and deciduous mixed habitats) is present throughout the Project Area including within the forested stands proposed for treatments. Considering only the small to medium size dead and defective tree habitat component, the thinning project would be expected to have some negative impacts upon the habitat of smaller primary cavity nesters. This is based on the fact many of the existing smaller snags present within the treated stands would be expected to be inadvertently knocked over during harvest operations or purposefully felled as safety hazards. However Hayes et. al. found that hairy woodpeckers detections increased substantially in treated stands after the thinning operation (Hayes et al. 2003); this would suggest that factors other than simply the presence of small to medium size dead and defective tree habitat is involved in dictating the quality of habitat for some primary cavity nesters such as the hairy woodpecker. In the longer term, most of the trees being harvested by the thinning project would eventually be expected to die due to suppression related mortality under a "no-action" scenario and thereby increase the foraging and nesting habitat quality for many of these species. Potential negative impacts upon primary cavity nesters have been minimized through project design features such as CWD creation, dispersing treatments across a broad area, reserving all felled snags as CWD, and identifying and preserving patches of unthinned forest.

The impacts to ruffed grouse are expected to be minimal. This is based upon the dispersed nature of the treatments, design features to reserve all hardwoods including small patches, and identifying and preserving patches of unthinned forest.

Survey and Manage Species

Survey Strategy Category 2 Survey and Manage Species are those identified in the Northwest Forest Plan (NWFP) that requires pre-disturbance surveys for all proposed habitat altering activities. The following provides information about their habitat relationships, their likelihood of occurrence in the project area and, if surveyed for, the results of the surveys and management recommendations for protection of known sites.

Red Tree Vole

The red tree vole would not be affected by either Gauldy alternative based upon the fact that no habitat for this species would be impacted.

Mollusks

Mortality to mollusks may result from mechanical crushing and from increased exposure to predation and desiccation. Ground and log disturbance and removal of trees or shrubs providing shade, food and protective cover could result in the loss of habitat and mortality to these species.

Survey and Manage mollusk surveys for the Gauldy commercial thinning units were conducted to protocol in and near all proposed timber sale units in the spring and fall of 2000 resulting in the identification of 210 "known sites" for warty jumping slug (*Hemphillia glandulosa*).

The 2001 annual review for Survey and Manage (S&M) species was completed on June 14 2002 in compliance with the 2001 Record of Decision (ROD) for amendments to the S&M, Protection Buffer, and other Mitigation Measures Standards and Guidelines (S&Gs). This review removed the requirement to manage warty jumping slug (*Hemphillia glandulosa*) known sites, however the Hebo Ranger District elected to continue plans to manage the species at the identified sites. This will be accomplished by the establishment of "Habitat Areas" to provide for the species at the site. Although it is no longer required, this would be in accordance with *Management Recommendations for Survey and Manage Terrestrial Mollusks - Section number 6, Management Recommendations for Four Species of the Genus Hemphillia (version 2.0 dated October 1999).* The actual configurations of the Habitat Areas would be based on the guidance provided within the *Interim Management Recommendations for Terrestrial Mollusk - Siuslaw National Forest* (June 1999).

The Habitat Areas would be configured in such a way as to provide protection to the sites and maintain the sites current micro-climate. Project design features such as reserving all hardwoods throughout the thinning units and minimizing disturbance to existing CWD would benefit the Habitat Areas current and future habitat quality, as well as the habitat throughout the entire thinning unit. Maintenance of the current canopy closure within the Habitat Area would help provide protection to the site's current conditions through maintaining a well-shaded forest floor in and adjacent to the known site and assuring a continued supply of leaf litter and CWD to the forest floor. If any post-harvest, burning takes place, the integrity of Habitat Areas would be maintained by using appropriate fire protection measures. Logging equipment or logging corridors would not be permitted within the Habitat Areas. Trees would not be felled into the Habitat Areas. Based upon these design features it is expected that warty jumping slug (*Hemphillia glandulosa*) populations at the "known sites" near the Gauldy Thinning project area would be maintained and/or enhanced at the identified sites.

In addition to the commercial thinning treatment units, the Gauldy project proposes CWD enhancement projects in areas which currently contain suitable habitat for S&M mollusks; some of the areas may be in the vicinity of the identified "known sites". Within approximately 50 to 100 acres of dense Douglas-fir dominated stands which are yet to be identified but located within the Project Area, 10 to 50 trees per acre would be girdled or cut and left on site to augment existing CWD levels and encourage the development of scattered larger trees. Based upon the design features of the proposed treatment, as well as the nature of the habitat features to be impacted, the CWD enhancement projects have been determined to be potentially "habitat altering" to the point of triggering the need for pre-project surveys. The identification of the 50 to 100 acres for CWD treatment would focus on those areas where S&M surveys were conducted but which are not planned for thinning treatment. While the CWD enhancement projects have been determined to be potentially "habitat altering" to the point of triggering the need for pre-project surveys, CWD creation is not viewed as being inherently in conflict with protection of a known site. As stated guidance provided within the *Interim Management Recommendations for Terrestrial Mollusk - Siuslaw National Forest* (June 1999), "the size of the protection buffer needed is in part a function of the type of treatment prescribed." The CWD treatment has been designed to include feature to minimize the potential for impacts to mollusk sites. The areas selected for CWD treatment would avoid areas of concentrated known sites. Within CWD treatment units, the center of the known sites would be buffered with an approximate 30' buffer. Aspect would be considered; on southern aspects the creation of appreciable gaps would be avoided within 50' of a known site. Where determined to be beneficial, focus would be on snag creation rather than down wood creation. Trees to be felled would be felled away from known sites. Implementation of the CWD enhancement projects would be expected to reduce the average canopy closure by no more than 5 or 10%. Based upon these design features it is expected that warty jumping slug (*Hemphillia glandulosa*) populations at the known sites near the Gauldy CWD enhancement project areas would be maintained and/or enhanced at the identified sites.

Landbirds

Potential project effects on landbirds are due to impacts from disturbance and/or impacts to their habitat.

There would be no effects on landbirds under the No Action Alternative.

Impacts from disturbance are due to activities above normal ambient levels within approximately 100 yards of active nests. The main impacts of disturbance are flushing an incubating adult resulting in cooling of eggs or possible nest abandonment. Commercial and precommercial thinning activities would directly result in the short-term reduction or alteration of vegetation structure, cover or composition of nesting, rearing and foraging habitat. Indirect effects could include the loss of vegetation which helps support insect prey. Cumulative effects would be minimal due to the regrowth of understory plants over time.

Under Alternative 2, the seasonal restrictions applied to the commercial thinning and roads management project for spotted owls and/or marbled murrelets would help minimize the potential impacts to nesting and fledging as breeding activities of many species would be completed before harvesting or related activities alter NTMB breeding habitat or create disturbance. The seasonal restriction applied to the precommercial thinning project requiring work to be accomplished from October 1 through February 29 effectively eliminates any potential for impact to landbird breeding activities as it focuses activities to the non-breeding season.

The Hammond's flycatcher may benefit by thinning the Gauldy stands; the Pacific slope flycatcher uses stands retaining a higher number of trees per acre and may not benefit by the planned thinning (Hayes, 1995).

Roosevelt Elk and Black-tailed deer

The amount of deer and elk use within the Project Area is not expected to change due to project implementation, although their distribution and behaviors within the area will shift as they respond to changes in their environment. Changes in hiding cover and the disturbances resulting from increased human presence and project implementation will alter current daily behaviors; the project could temporarily displace individual deer and elk as they react to disturbances within the area. Travel corridors in portions of the treated stands as may be disrupted as logging slash and down wood shift games trails and adjust animal movements. These impacts are not expected to impact the health of the populations do to the nature of the disturbances, adaptability of the species, limited period of disturbance, and the fact that adequate undisturbed habitat is present throughout the Project Area.

Although the proposed action could have a slight, negative short-term impact upon cover for big game in portions of the thinned units, other suitable thermal and/or hiding cover exists within the general area including within plantation stands not proposed for thinning as well as mature stands adjacent to the project units. Although the quality of hiding and thermal cover within the thinning units would decrease post treatment until an understory layer develops and overstory crowns expand, areas which are thinned should continue to function, in some regard as hiding and/or thermal cover for big game; forested stands should still help moderate temperature and wind extremes as well as serve as a visual buffer. The project would not be expected to result in a short-term reduction of available cover to point where it would be become a limiting factor, negatively impacting the population health of these species. Thermal cover is probably less important or limiting within the Coast Range of northern Oregon than in other portions of these species' range, due to the mild winters and summers within the region.

The projects are expected to result in some improvements in the habitat quality available for elk and deer. Thinning would result in an interspersion of foraging areas and cover. As a result of the thinning treatment the vigor of the herb and shrub understory layers should be increased thereby improving the quality of available browse and/or forage. Understory development would be expected to be most notably and long-lasting in areas of lower overstory retention and in association with small gaps and openings. Alternative 2 proposes to reduce the amount of roads within the Project Areas that are open to the public from approximately 66.6 miles to 30.6 miles; this would result in a decreased level of general disturbance and would improve the quality of the available habitat, especially for Roosevelt elk.

Alternative 3

This alternative drops the proposals for 1,658 acres of pre-commercial thinning that are contained in Alternative 2 and proposes alternative ways to maintain road access to private land.
Relative to Alternative 2, the changes to the proposed ways of managing a few of the key roads within the Project Area under this alternative (most notably 1588-112) effectively would have no change in the ways or amount of road the general public would find accessible. Therefore, the alternative ways to maintain road access to private land that is contained within Alternative 3 is not expected to result in an appreciable difference from Alternative 2 in the expected impacts to wildlife resulting from disturbance created by the general public. Roughly the same numbers of people would be expected to utilize the area for activities such as harvesting special forest products, hunting, shooting target and recreating in general. Alternative 3 could result in an increased amount of future disturbance impacts from forest management activities on federal land as well as on some parcels of private land, as access to fewer currently untreated plantations would be lost thereby making the probability of future treatment more realistic and likely to occur.

Alternative 4

Like Alternative 3, this alternative also drops the proposal for 1,658 acres of pre-commercial thinning. Alternative 4 proposes that only Forest Roads 1500 and 1533 would be maintained open for public travel. They would be maintained at Maintenance Level 2 which is for high clearance vehicles only. The remaining open Forest and Unclassified Roads would be decommissioned or closed to vehicle travel, and remain on the Forest Road System as they are needed for future projects. Implementation of Alternative 4 would result in an increased, short-term level of noise disturbance (relative to Alternatives 1, 2 and 3) to wildlife based upon the fact that there would be more road work associated with decommissioning or closing the roads to vehicle travel. This increased level of noise however would not be on a level to impact the viability of any of the species of concern or result in elevation of their status to any higher level of concern including the need to list under the ESA.

In the long-term, implementation of Alternative 4 would result in decreased levels of noise disturbance which potentially impact some species of wildlife (relative to Alternatives 1, 2 and 3) based upon the fact that there would be fewer roads within the Project Area open to vehicle travel. Reduced pubic access would likely result in fewer people entering the National Forest Lands within the Project Area to gather special forest products, hunt, target shoot and/or drive recreationally. It could also likely reduce the amount of future forest management activities as access to some plantations would effectively be eliminated. Under Alternative 4, there would be approximately 13.3 fewer miles of road open to public use relative to Alternatives 2 and 3, and 49.3 fewer miles of road open to public use relative to the No Action Alternatives. The beneficial impacts of a reduced human presence within portions of the Project Area would be most notable for those species thought to be sensitive to high road densities and/or noise and disturbance in general such as Roosevelt elk or marbled murrelet.

Cumulative Impacts

"Cumulative Effects" are the impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time (CEQ 1508.7). Cumulative effects analysis provides greater insight into understanding the current environmental factors and the likely trends which might affect the environment.

Impacts to wildlife resources can take many forms that include but not limited to the harming, harassing or killing of individuals; alterations to key natural or ecological functions, relationships and/or processes such as parasitism or predator/prey relationships; and the modification or removal of habitat. Relative to wildlife resources, the only issue(s) identified within the *Nestucca Watershed Analysis* (October 1994), *Little Nestucca Watershed Analysis* (June 1998) and the North Coast LSRA with a likelihood for cumulative effects is related to factors affecting the distribution of sensitive species. In general the distribution of the identified sensitive species is strongly correlated to the distributed to habitat, primarily late-seral habitat.

There are no adverse cumulative effects associated with the modification of habitat for the species of concern which utilize late-seral habitat which are expected to result from any of the proposed action alternatives. This is based upon the facts that the proposed density management projects would not take place within stands which are currently providing late-seral habitat; the proposed treatments would in fact, promote the development of late-seral habitat sooner than would occur without treatment. Similarly, the pre-commercial thinning projects are also designed to promote the development of late-seral habitat. The density management treatments would not occur within spotted owl, marbled murrelet or bald eagle suitable habitat but rather would occur within stands which have been determined to be dispersal habitat for the spotted owl; the treated stands are expected to continue to be able to function as dispersal habitat post-harvest.

The cumulative impacts resulting from the proposed action alternatives and the additional known projects would not be of a magnitude as to negatively impact species of concern. This is based on the following reasons: 1) Based upon the distribution of habitat, much of the potential for cumulative impacts to wildlife species of concern result from federal actions which generally incorporate seasonal and daily time restrictions to reduce the potential of disturbance to murrelet breeding activities; 2) The projects likely to occur within the Project Area are expected to be generally separated by space and time sufficiently as to not repeatedly or continually disturb the same large blocks of late-seral stage habitat. 3) While it is possible that activities occurring on non-federal lands which are in proximity to species occupying federal land could create the potential for disturbance, the bulk of the mid- to late-seral stage habitat within the Project Area is located on federal land in a relatively contiguous federal ownership block.

The No Action Alternative

Given the expectation of continuing trends on non-federal lands within the watershed resulting in decreasing quantities of mid- and late-seral habitat, there is potential for adverse cumulative impacts associated with the "No Action" alternative. This is based upon the fact that the proposed density management projects would not take place; these projects have been designed specifically to promote the development of late-seral habitat sooner than would occur without treatment. That is to say, the accelerated development of late-seral habitat resulting from the implementation of action alternatives would in effect, be helping to offset the expected trends occurring on non-federal land; by selecting the "No Action" alternative there would be potential for adverse cumulative impacts. The timing of the potential adverse cumulative impacts associated with the "No Action" alternative would be expected to mirror the timing of the benefits associated with the implementation of the action alternative. In the case of some of the project design features such as CWD enhancement, some of the associated benefits would begin essentially at the time of project implementation, while other benefits of the thinning treatments would be expected to increase gradually over time as the reserve trees within the treated stands respond to the decreased competition (see *Silvicultural Prescription for the Gauldy Project* - Appendix 2). There are no cumulative impacts from disturbance on federal wildlife resources for Alternative 1 because no noise generating activities are planned under this alternative.

Impacts from Past Non-Federal Activities

Impacts to federal wildlife resources in the project area from either disturbance or habitat alternation on non-federal lands have been minimal due to the distance between the project area and non-federal ownership. There are minimal disturbance effects from non-federal land management activities on wildlife resources from past activities because of the fact that the federal lands within the Project Area are relatively blocked up and little non-federal exists within 0.25 miles of the project areas. Federal lands within the Project Area are located at the higher elevations within the Project Area while the bulk of the non-federal lands tend to be along rivers in the agricultural zones.

Impacts from Past Federal Activities

Impacts to wildlife resources in the project area from either disturbance or habitat alternation on federal lands have occurred. Impacts from past activities as a result of disturbances in the Project Area resulted from projects such as the harvest of special forest products, road and young plantation maintenance, meadow maintenance, and dispersed recreation. There are only minor cumulative impacts anticipated from disturbance on federal wildlife resources from past federal activities for the action alternatives because activities are planned to occur late in the season when there are few recreationalists and at a time when the severity of wildlife impacts are far less than earlier in the year. Additionally, most past, present, and future activities on federal lands that have the potential to disturb nesting marbled murrelets incorporate daily time restrictions to help minimize the potential for impacts, including cumulative impacts. This restriction not only helps avoid impacts to nesting murrelets but would also benefit other species with similar activity patterns.

Past federal projects coupled with other factors such as fire history have resulted in the current condition of the federal land within the Project Area. Clear-cut harvesting of late-seral stage habitat on federal land within the Project Area was discontinued in the early to mid-1990s. Recent projects with the potential for resulting in the modification of late-seral stage habitat in the project area have been basically been restricted to the potential for the removal of an occasional hazard tree. There are no cumulative impacts to federal wildlife resources anticipated from past activities on federal lands for any of action alternatives based on the fact that the proposed density management projects would not take place within stands which are currently providing late-seral habitat.

Impacts from Present Non-Federal Activities

Impacts to federal wildlife resources in the project area from either disturbance or habitat alternation on non-federal lands from present activities are minimal due to the distance between the project area and non-federal ownership. There are no disturbance effects from non-federal activities on federal wildlife resources from present activities because all non-federal lands are greater than 0.25 miles from the project area.

There are no measurable impacts to federal wildlife resources in the project area from present non-federal habitat alteration activities primarily because of the distance, but also because little habitat alteration is currently occurring. There is relatively little late-seral stage habitat located on non-federal land within the Project Area. There are no cumulative impacts to federal wildlife resources anticipated from current activities on non-federal lands for any of the alternatives.

Impacts from Present Federal Activities

Limited disturbance in the project area from current federal activities such as the harvest of special forest products, meadow maintenance, and dispersed recreation does occur however impacts to federal wildlife resources in the project area from disturbance on federal lands are expected to be very minor. There are only minor cumulative impacts anticipated from disturbance from present federal activities for the action alternatives because federal activities incorporate daily time restrictions where appropriate and there are relatively few activities planned to occur within the Project Area. In addition, these projects are generally planned to occur late in the season when there are fewer recreationalists and at a time when the severity of wildlife impacts are far less than earlier in the year.

There are no other federal habitat alteration projects planned in the project area, therefore there are no cumulative impacts to federal wildlife resources as a result of habitat modification anticipated from present activities on federal lands for any of the action alternatives.

Impacts from Future Non-Federal Activities

Less information is available on habitat altering management activities to occur on non-federal lands however, the general trend on private land is one of decreasing quantities of late-seral habitat. The majority of non-federal forestland within the Project Area is owned by industrial timber companies and is managed for timber production. This generally precludes the development and/or maintenance of late-seral habitat. While private lands within the northern portion of the Oregon Coast Range, including the Gauldy Project Area, support some dispersal habitat for the northern spotted owl, the suitable habitat for the spotted owl, marbled murrelet and bald eagle on these lands is very limited in quantity and marginal in quality thereby not notably contributing to the viability of the species (see table 2). Before the spotted owl was listed as a threatened species under the ESA, Thomas et al. estimated in *A Conservation Strategy for the Northern Spotted Owl* (USDA and USDI 1990) that most privately-owned spotted owl habitat in Oregon would be eliminated within 10 years. Within the *Recovery Plan for the Marbled Murrelet* (USDI 1997) the USFWS recognized that most of the nesting habitat on private land had been eliminated by timber harvest and that the remaining tracts of potentially suitable habitat on private lands are subject to continuing timber harvest operations. Additionally, in most areas, second-growth forests have been or are planned to be harvested before they will attain the characteristics of older forests. Because the majority of private forest land within the vicinity of the proposed action area is managed for timber production, little spotted owl, bald eagle or murrelet suitable habitat remains on these lands. Habitat conditions on these lands are not expected to appreciably improve within the foreseeable future and the limited mid- and late-seral stage habitat that does remain is expected to be greatly reduced over time.

Impacts to federal wildlife resources in the project area from either disturbance or habitat alternation on non-federal lands from future activities will be minimal due to the distance between the project area and non-federal ownership. There are no disturbance effects from non-federal activities on federal wildlife resources from future activities because all non-federal lands are greater than 0.25 miles from the project area.

Impacts from Future Federal Activities

Limited disturbance in the project area from future federal activities such as the harvest of special forest products, meadow maintenance, and dispersed recreation may occur however impacts to federal wildlife resources in the project area from disturbance on federal lands are expected to be very minor. There are only minor cumulative impacts anticipated from disturbance on federal wildlife resources from future federal activities for the action alternatives because activities are planned to occur late in the season when there are fewer recreationalists and at a time when the severity of wildlife impacts are far less than earlier in the year. Federal projects with potential to disturb nesting murrelets would include daily time restrictions to minimize the potential for negative impacts. While the future cumulative impacts as a result of disturbance are expected to be minor under all of the action, they would be expected to be the least under Alternative 4 based on the fact that this alternative appreciably reduces the open road system on the National Forest Lands within the Project Area.

There are no additional federal projects planned within the Project Area that would modify late-seral stage habitat or important habitat elements such as CWD other than those in the proposed action alternatives. Therefore, there are no cumulative impacts to wildlife resources of concern are anticipated from future activities on federal lands. The negative impacts upon habitat quality from projects likely to occur within the Project Area such as continued meadow maintenance, road maintenance or harvest of special forest products are considered to be short-lived and negligible upon identified species of concern.

From cumulative impacts perspective, considering future federal actions and the fact that Alternatives 3 and 4 drop the proposals for 1,658 acres of pre-commercial thinning, which is contained within Alternative 2, there is no difference between Alternatives 2, 3 and 4. Therefore considering future federal actions and pre-commercial thinning and riparian planting there is no difference between alternatives 1, 2, 3 and 4.

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D. Aquatic Conservation Strategy

Introduction

The Aquatic Conservation Strategy is included in the Record Decision for the Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD), April 1994 – see pages B-9 through B-34. This strategy was developed to restore and maintain the ecological health of watersheds and the aquatic ecosystems contained within them. It focuses on protecting habitat for fish and other riparian-dependant species and restoring degraded habitats on federal lands managed by the Forest Service and Bureau of Land Management within the range of Pacific Ocean anadromy. To do this, the ROD established Standards and Guidelines that, if implemented, would meet the nine Aquatic Conservation Strategy Objectives, listed on page B-11. The baseline from which to assess maintaining or restoring the condition is developed through watershed analysis. Management actions that do not maintain the existing condition or lead to improved conditions in the long term, would not meet the intent of the Aquatic Conservation Strategy and thus should not be implemented.

The Gauldy Area is contained within the Nestucca and Little Nestucca watersheds. The required watershed analyses (WAs) were completed in 1994 and 1998, respectively. These documents contain descriptions of the existing conditions found in the watersheds, and recommended actions to manage the aquatic and terrestrial habitats within each. The information in the WAs describes conditions that do not meet a desired future condition that would meet the Aquatic Conservation Strategy in the future.

The goal of the Gauldy Project is to implement management actions that would restore the watershed and aquatic conditions in the Project Area to the desired future conditions described in the Siuslaw Forest Plan and the WAs. Within Chapter 1 of the Gauldy Project Environmental Assessment is a brief description of the existing and desired conditions.

A test to determine if the actions proposed in the Gauldy Project do maintain or lead to improved conditions in watersheds in the long term is how the proposed actions would meet the 9 Aquatic Conservation Objectives, listed in the ROD, page B-11. This is discussed below. It is important to remember that area affected by these proposed actions is small in relation to the size of the two watersheds, and the validation of how the Aquatic Conservation Strategy would be met must be done at the watershed scale or larger.

Aquatic Conservation Objectives

1. Maintain and restore the distribution, diversity and complexity of watershed and landscape scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Alternative 1 No Action: The young managed stands would continue to develop at much slower rate and some may not reach the desired condition. Lack of road maintenance funds may result in some roads failing and causing down stream damage to aquatic habitat. Exactly how much damage would occur and its effects are difficult to quantify.

Alternatives 2, 3 and 4- Plantation thinning would accelerate the development of late successional watershed conditions. Thinning and riparian planting would increase the rate of development of large conifers in riparian and upslope areas, understory complexity, and species diversity, a desired condition as described in the Gauldy Project Environmental Assessment.

The proposed road management actions would result in a road system that meets the desired condition of a road that is safe and minimized the effects to the aquatic systems in the Gauldy Area.

2. Maintain and restore spatial and temporal connectivity within and between watersheds, lateral, longitudinal and drainage network connections including floodplains, wetlands, upslope areas, headwater tributaries and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Alternative 1 No Action: Spatial and temporal connectivity would be maintained.

Alternatives 2, 3 and 4:- Spatial and temporal connectivity within and between watersheds will be improved through plantation thinning, riparian planting and road management. Thinning will accelerate the rate that plantations will function as mature stands and increase the connectivity among existing stands. Improved connectivity will allow aquatic and riparian dependent species better access to refugia to allow development of diverse life history types. Riparian planting and road management proposed actions would help improve aquatic conditions that may directly and indirectly maintain and restore spatial and temporal conductivity.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks and bottom configurations.

Alternative 1 No Action: The physical integrity of the aquatic system, including shorelines, banks, and bottom configurations would be maintained.

Alternatives 2, 3 and 4. A goal of the proposed actions of the Gauldy Project is to improve watershed and aquatic conditions. The design criteria (mitigations) listed in Chapter 2; pages 2-2 to 2-10 of the Gauldy Project Environmental Assessment would prevent long term adverse effects to the physical integrity of the aquatic system.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical and chemical integrity of the system and benefits survival, growth, reproduction and migration of individuals composing aquatic and riparian communities.

Alternative 1 No Action: Water quality necessary to support healthy riparian, aquatic and wetland ecosystems will be maintained at present conditions

Alternatives 2, 3 and 4: A goal of the proposed actions of the Gauldy Project is to improve watershed and aquatic system conditions in the long term. By implementation of the design criteria (mitigations) listed in Chapter 2; pages 2-2 to 2-10 of the Gauldy Project Environmental Assessment would minimize the effects on water quality by these actions.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate and character of sediment input, storage, and transport.

Alternative 1 No Action: The development of the young managed stands would continue, but at various rates. Some of these stands are a source of sediment due to the lack of understory vegetation. This rate of sediment would continue until the understory is restored beneath them.

Pulses of sediment would continue to come from roads that fail and are not properly maintained in the short term. In the long term it is expected that these problems would subside over time.

Alternatives 2, 3 and 4: A goal of the proposed actions of the Gauldy Project is reduce the sediment from roads and young managed stands. Implementation of these actions would reduce the amount of sediment that may reach the streams in the Gauldy Project Area in the short term versus what may occur under the No Action Alternative.

6. Maintain and restore in-stream flows to create and sustain riparian, aquatic and wetland habitats and to retain patterns of sediment, nutrient and wood routing. The timing, magnitude, duration and spatial distribution of peak, high and low flows must be protected.

Alternative 1 No Action: In-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing will be maintained. However, the unthinned stands and roads may produce pulses of sediment and water flows above what is desired.

Alternatives 2, 3 and 4: A goal of the proposed actions of the Gauldy Project is reduce the sediment from roads and young managed stands. The development of large conifer trees as a result of the proposed riparian planting and stream side thinning would reduce the time this source of large wood would be available for streams versus the No Action Alternative.

7. Maintain and restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1 No Action: The timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would be maintained at the current conditions, but possibly not at a desired rates because the of the pulses of water and sediment that may come from roads that either fail or are not maintained, and unthinned young managed stands that develop at slow rates or not at all.

Alternatives 2, 3 and 4: A goal of the proposed actions of the Gauldy Project is to change the watershed conditions in the Gauldy Project Area to reflect a desired condition that reflects timing, duration and variability of water and sediment flows that may have occurred prior to development of roads and young managed stands in the Gauldy Area.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, ban erosion and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Alternative 1 No Action: Species composition and structural diversity of plant communities in riparian areas will be maintained at the current rate. However, improvement of the species composition and structural diversity of plant communities in riparian areas and wetlands may be adversely affected by: 1) The pulses of sediment from the young managed stands, and roads that fail or are not properly maintained. 2) The slow development of large conifers along streams as source of large coarse wood. 3) No actions to improve the alder dominated streams to improve shade and long term source of large coarse woody debris.

Alternatives 2, 3 and 4: A goal of the proposed actions of the Gauldy Project is to improve the conditions that would help restore the species composition and structural diversity of plant communities in riparian areas and wetlands. The thinnings would improve the development of understory vegetation to help reduce erosion from them, and accelerate the development of large conifers as a source of large coarse woody debris. The road management actions would reduce the sediment from roads. The riparian planting would help develop large conifers along the stream to increase shade and be a source of large woody debris.

9. Maintain and restore habitat to support well distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Alternative 1 No Action: Habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species would be maintained at the current conditions and rates and would not increase the rate of recovery in the short term. Some improvement is expected as roads stabilize and stand growth and plant diversity in the young managed stands increases.

Alternatives 2, 3 and 4: A goal of the proposed actions of the Gauldy Project is to improve in the short term the habitat or the conditions that affect native plants, invertebrate and vertebrate riparian dependent species by thinning over crowded young managed conifer stands, increasing the diversity of the plant community in riparian areas by planting conifers and thinning, and management of road system to reduce sediment that may reach the streams inhabited by these species. Continual implementation of actions similar to the proposed actions would improve the habitat for these species in the long term.

8. Glossary

Critical habitat: Under the Endangered Species Act, critical habitat is defined as (1) the specific areas within the geographic area occupied by 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 areas occupied by a listed species, when it is determined that such areas are essential for the conservation of the species.

Decommissioning: Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1, (FSM 7703). Decommissioning may include the following:

- Closing entrances -preferably using full-restoration techniques to obscure.
- Scarifying road surfaces, or decompacting (subsoiling or ripping) to establish vegetation and reduce run-off.
- Seeding to control erosion and in some cases provide forage.
- Partial to full restoration of stream channel by removing culverts and fills.
- Water-barring and cross-ditching of roadbed.
- Removing unstable portion of embankments.

Debris torrent: A large debris slide that is charged with water and confined to a steep stream channel. Debris torrents may travel several thousand feet.

Diameter at Breast Height (DBH): The diameter of a tree measured at a point 4 feet 6 inches above the ground.

Fish bearing streams: Any stream containing any species of fish for any period to time.

Forest Roads: As defined in Title 23, Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partly within, or adjacent to, and serving the NFS land and which is necessary for the protection, administration, and utilization of the NFS land, or the use and development of its resources.

Interdisciplinary Team (ID team): A group of individuals with varying areas of scientific and/or technical 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 proposed action.

Issue: A point, matter, or question of public discussion or interest to be addressed or decided through the planning process.

Mitigation measures: Modifications of actions that (1) avoid impacts by not taking certain actions or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resource or environments.

Precommercial thinning: The removal of tress not for immediate financial return but to reduce stocking to concentrate growth on the more desirable trees, or to accomplish some other resource objective.

Perennial stream: A stream that runs water every month during most years.

Residual stand: The trees remaining after some event such as selective cutting.

Road Decommissioning: See *Decommissioning*

Road Maintenance: The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.

Road Maintenance Levels: Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria:

> Maintenance Level 1 Assigned to intermittent service roads during the time they are not closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.
>
> Maintenance Level 2 Assigned to roads open to for use by high clearance vehicles. Passenger car traffic is not a consideration.
>
> Maintenance Level 3 Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.
>
> Maintenance Level 4 Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.
>
> Maintenance Level 5 Assigned to roads that provide a high degree of user comfort and convenience. Normally, these roads are double lane and paved or aggregate surfaced with dust abatement.

Road Management Objective: Defines purpose, operational use and maintenance level of a road based on resource management and access and travel management objectives.

Road Reconstruction: Activity that results in the improvement or realignment of an existing classified road as defined below:

a. Road Improvement--Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change on its original design function.
b. Road Realignment--Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

Silvicultural Prescription: A professional plan for controlling the establishment, composition, constitution and growth of forests.

Stabilization: A process to slope, dip and waterbar travelways to reduce run-off concentrations and alleviate risk of erosion and landslides, should designed drainage structures fail to carry storm event. This also includes grass seeding slopes. Unstable fill embankments that exceed the required travelway may be partially or fully removed.

Standards and Guidelines: The rules and limits governing actions, and the principles specifying the environmental conditions or levels to be achieved or maintained.

Stocking/stocked: The degree to which trees occupy an area of land. Stocking may be measured directly, using statistics such as the number of trees per acre or square feet of basal area per acre that trees occupy, or relatively, using descriptive terms (such as "clumpy" or "scattered") or quantitative numbers that describe stand or tree density.

Stand (tree stand): An aggregation of trees occupying a specific areas and sufficiently uniform in composition, age, arrangement, and condition is to be distinguishable from the forest in adjoining areas.

Temporary Road: Roads associated with such uses as timber sale contracts, mining operating plans, temporary private land access etc. These roads are not intended to be a part of the Forest Road System, as they are not needed for permanent administrative access or resource management.

Watershed analysis: A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis provides a basis for ecosystem management planning that applies to watersheds of about 20 to 200 square miles.

9.Maps

Gauldy Project Map 1 Proposed Action
Gauldy Project Map 2
Gauldy Project Alternative 3
Commercial Unit Maps