

Chapter 2

Forest-wide Management Direction

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Aquatic Conservation Strategy	2-1
Aquatic Conservation Strategy Objectives	2-2
Components of the Aquatic Conservation Strategy	2-3
Table 2-1 Interim Riparian Reserve widths	2-7
Table 2-2 Riparian Reserve “Buffer” Widths	2-7
Table 2-3 Watershed Analysis (WSA) Requirements Matrix	2-14
Monitoring	2-17
Resource and Program Area Direction	2-18
Facilities	2-18
Heritage Resources Program	2-24
Lands and Minerals	2-28
Protection	2-36
Range	2-39
Recreation	2-40
Table 2-4 Visual Quality Objectives.....	2-42
Table 2-5 Timber harvest standards and guidelines	2-43
Table 2-6 Trail Management standards and guidelines	2-49
Table 2-7 Rivers recommended for designation.	2-51
Table 2-8 Eligible rivers for further study. [.....	2-51
Research	2-53
Rural Community and Human Resources	2-54
Timber	2-54
Table 2-9 Noxious weeds listed by the State of Washington	2-56
Water, Soil, and Air	2-58
Wildlife, Fish, Plants, and Fungi	2-63
Table 2-10 Species Documented or Suspected to Occur on the GPNF.....	2-66
Figure 2-1. Generalized influence of increasing open road density.....	2-74
Late-Successional Reserve Protection Buffers	2-79
Managed Late-Successional Areas Protection Buffers	2-80

Chapter 2

Forest-wide Management Direction

As explained in Chapter 1, direction contained in this document applies at three scales—Forest-wide, designated area and management area. This chapter describes direction which applies Forest-wide, in all designated areas and management areas. It begins with the Aquatic Conservation Strategy which includes direction for Riparian Reserves.

This chapter begins with an overview of the Aquatic Conservation Strategy. Following this overview is a description of Forest-wide programs and resource areas. Each program area addresses the Aquatic Conservation Strategy using standards and guidelines for Riparian Reserves, where applicable.

Aquatic Conservation Strategy [ROD B-9>

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy will protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of Pacific Ocean anadromy.

This conservation strategy uses several methods to further the goal of maintaining a “natural” disturbance regime. Land use activities need to be limited or excluded in those parts of the watershed prone to instability. The distribution of land use activities, such as timber harvest or roads, must minimize increases in peak streamflows. Headwater riparian areas need to be protected, so that when debris slides and flows occur, they contain coarse woody debris and boulders necessary for creating habitat farther downstream. Riparian areas along larger channels need protection to limit bank erosion, insure an adequate and continuous supply of coarse woody debris to channels, and provide shade and microclimate protection. Watersheds currently containing the best habitat or those with the greatest potential for recovery should receive increased protection and receive highest priority for restoration programs.

Any species-specific strategy aimed at defining explicit standards for habitat elements would be insufficient for protecting even the targeted species. The Aquatic Conservation Strategy must strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds. Because it is based on natural disturbance processes, it may take decades, possibly more than a century, to accomplish all of its objectives. Some improvements in aquatic ecosystems, however, can be expected in 10 to 20 years.

The important phrases in these standards and guidelines are:

“meet Aquatic Conservation Strategy objectives”

“does not retard or prevent attainment of Aquatic Conservation Strategy objectives”

“attain Aquatic Conservation Strategy objectives.”

These phrases, coupled with the phrase *“maintain and restore”* within each of the Aquatic Conservation Strategy objectives, define the context for agency review and implementation of management activities. Complying with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore conditions. The base line from which to assess maintaining or restoring the condition is developed through a watershed analysis. Improvement relates to restoring biological and physical processes within their ranges of natural variability.

The standards and guidelines are designed to focus the review of proposed and certain existing projects to determine compatibility with the Aquatic Conservation Strategy objectives. The standards and guidelines focus on *“meeting”* and *“not preventing attainment”* of Aquatic Conservation Strategy objectives. The intent is to assure that a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives. The decision maker will use the results of watershed analysis to support their finding. In order to make the finding that a project or management action *“meets”* or *“does not prevent attainment”* of the Aquatic Conservation Strategy objectives, the analysis must include:

- a description of the existing condition
- a description of the range of natural variability of the important physical and biological components of a given watershed
- how the proposed project or management action maintains the existing condition or moves it within the range of natural variability.

Management actions that do not maintain the existing condition or do not lead to improved conditions in the long term would not *“meet”* the intent of the Aquatic Conservation Strategy and thus, should not be implemented.

Aquatic Conservation Strategy Objectives

National Forest lands within the range of the northern spotted owl will be managed to:

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.
2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, 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.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.
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.
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.
6. Maintain and restore in-stream flows sufficient 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.
7. Maintain and restore the timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.
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, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Components of the Aquatic Conservation Strategy

1. *Riparian Reserves*: Lands along streams and unstable and potentially unstable areas where special standards and guidelines direct land use.
2. *Key Watersheds*: A system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water.
3. *Watershed Analysis*: Procedures for conducting analysis that evaluate geomorphic and ecologic processes operating in specific watersheds. This analysis should enable watershed planning that achieves Aquatic Conservation Strategy objectives. Watershed analysis provides the basis for monitoring and restoration programs and the foundation from which Riparian Reserves can be delineated.
4. *Watershed Restoration*: A comprehensive, long-term program of watershed restoration to restore watershed health and aquatic ecosystems, including the habitats supporting fish and other aquatic and riparian-dependent organisms.

These components are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems. Late-Successional Reserves are also an important component of the Aquatic Conservation Strategy.

The standards and guidelines within which Late-Successional Reserves are managed provide increased protection for all stream types. Because these reserves possess late-successional characteristics, they offer core areas of high quality stream habitat that will act as refugia and centers from which degraded areas can be recolonized as they recover. Streams in these reserves may be particularly important for endemic or locally distributed fish species and stocks. <ROD B-12]

Riparian Reserves [ROD B-17]

Summary of Aquatic Conservation Strategy for Riparian Reserves:

- Involves portions of the landscape where riparian-dependent and stream resources receive primary emphasis.
- Riparian Reserves are designated for all permanently-flowing streams, lakes, wetlands, and intermittent streams.
- Riparian Reserves include the body of water, inner gorges, all riparian vegetation, 100-year flood plain, landslides and landslide prone areas.
- Reserve widths are based on some multiple of a site-potential tree or a prescribed slope distance, whichever is greater. Reserve widths may be adjusted based on watershed analysis to meet Aquatic Conservation Strategy objectives.
- Standards and guidelines prohibit programmed timber harvest, and manage roads, grazing, mining and recreation to achieve objectives of the Aquatic Conservation Strategy. <ROD B-17]

[ROD B-12]

Riparian Reserves are portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. Standards and guidelines prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. Riparian Reserves include those portions of a watershed directly coupled to streams and rivers. Riparian Reserves are required for maintaining hydrologic, geomorphic, and ecological processes that directly affect standing and flowing water such as lakes and ponds, wetlands, streams, stream processes, and fish habitats. Riparian Reserves include primary source areas for wood and sediment such as unstable and potentially unstable areas in headwater areas and along streams. Riparian Reserves occur at the margins of standing and flowing water, intermittent stream channels, ephemeral ponds and wetlands. Riparian Reserves generally parallel the stream network but also include other areas necessary for maintaining hydrologic, geomorphic, and ecological processes.

Under the Aquatic Conservation Strategy, Riparian Reserves are used to maintain and restore riparian structures and functions of intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone

between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed. The Riparian Reserves will also serve as connectivity corridors among the Late-Successional Reserves.

Interim widths for Riparian Reserves necessary to meet Aquatic Conservation Strategy objectives for different water bodies are established based on ecologic and geomorphic factors. These widths are designed to provide a high level of fish habitat and riparian protection until watershed and site analysis can be completed. Watershed analysis will identify critical hillslope, riparian, and channel processes that must be evaluated in order to delineate Riparian Reserves that assure protection of riparian and aquatic functions.

Riparian Reserves are delineated during implementation of site-specific projects based on analysis of the critical hillslope, riparian, and channel processes and features. Although Riparian Reserve boundaries may be adjusted on permanently-flowing streams, the prescribed widths are considered to approximate those necessary for attaining Aquatic Conservation Strategy objectives. Post-watershed analysis Riparian Reserve boundaries for permanently-flowing streams should approximate the boundaries prescribed in these standards and guidelines. Post-watershed analysis Riparian Reserve boundaries for intermittent streams, however, may be different from the existing boundaries. The reason for the difference is the high variability of hydrologic, geomorphic and ecologic processes in a watershed affecting intermittent streams. At the same time, any analysis of Riparian Reserve widths must also consider the contribution of these reserves to other, including terrestrial, species.

Watershed analysis should take into account all species that were intended to be benefited by the prescribed Riparian Reserve widths. Those species include fish, mollusks, amphibians, lichens, fungi, bryophytes, vascular plants, American marten, red tree voles, bats, marbled murrelets, and northern spotted owls. The specific issue for spotted owls is retention of adequate habitat conditions for dispersal.

The prescribed widths of Riparian Reserves apply to all watersheds until watershed analysis is completed, a site-specific analysis is conducted and described, and the rationale for final Riparian Reserve boundaries is presented through the appropriate NEPA decision-making process. <ROD B-13]

Riparian Reserve Descriptions [ROD C-30]

Riparian Reserve Widths

Riparian Reserves are specified for five categories of streams or water bodies as follows:

1. *Fish-bearing streams* - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the

100-year flood plain, or to the outer edges of riparian vegetation, or to a slope distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

(See Table 2-1 and Table 2-2.)

2. *Permanently flowing nonfish-bearing streams* - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year flood plain, or to the outer edges of riparian vegetation, or to a slope distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.
3. *Constructed ponds and reservoirs, and wetlands greater than one acre* - Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a slope distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than one acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.
4. *Lakes and natural ponds* - Riparian Reserves consist of the body of water and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a slope distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.
5. *Seasonally flowing or intermittent streams, wetlands less than one acre, and unstable and potentially unstable areas* - This category applies to features with high variability in size and site-specific characteristics. At a minimum, the Riparian Reserves must include:
 - The extent of unstable and potentially unstable areas (including earthflows),
 - The stream channel and extend to the top of the inner gorge,
 - The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation, and
 - Extension from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest. (See Table 2-1.) [FP-IV-69]
6. *Wetlands and meadows less than 1 acre in size.* On slopes 20 percent and less, marshes, wet meadows (ecoclasses MS, MT, MW), moist meadows (MM), wet shrublands (SW, SS) and forblands (F) are withdrawn from scheduled timber harvest. An influence area, typically up to 300 feet beyond the extent of riparian vegetation, shall be managed consistent with a prescription developed by an interdisciplinary team including a hydrologist and biologist or such that 85 percent of timber stands are in pole size or larger and 50 percent of the entire influence area, is in mature and older age classes to provide hiding cover.
 On slopes greater than 20 percent, moist shrublands (SM, SS) wet shrublands (SW), moist meadows (MM) and forblands (F) are withdrawn from scheduled timber harvest. An influence areas, typically up to 300 feet beyond the extent of riparian vegetation, shall be managed consistent with a prescription developed by an interdisciplinary team including a hydrologist and biologist or to provide hiding cover such that no more than 10 percent of suitable timberland within the influence area is regeneration harvested in any decade. <FP-IV-72]

NOTE: A site-potential tree height is the average maximum height of the tallest dominant trees (200 years or older) for a given site class. (See Table 2-2 Site-Potential tree heights by tree species and riparian area site index.) <ROD C-31>

Table 2-1 Interim Riparian Reserve widths

(slope distance each side) by site tree height and distance for riparian types. Widths are the larger of the two measures. See text for other geomorphic and vegetative considerations.

Riparian Type	Site Tree Slope Widths (Tree Heights)	Slope Widths (feet)
Fish-bearing streams	2	300
Lakes and natural ponds	2	300
Perennial, nonfish-bearing streams	1	150
Constructed ponds, reservoirs and wetlands greater than 1 acre in size*	1	150
Wetlands less than 1 acre in size	N/A	See Text
Intermittent streams	1	100

*See LSR protection buffers for great gray owls on page 2-80.

Table 2-2 Riparian Reserve “Buffer” Widths¹

Site Class	Site Index Dominant Douglas-fir ²	Riparian Reserve “Buffer” Width ³
I	190’ to 210’	244’ to 257’
II	160’ to 180’	208’ to 232’
III	130’ to 150’	170’ to 195’
IV	100’ to 120’	150’ to 158’
V	80’ to 90’	150’ minimum for perennial streams; 100’ for intermittent streams
VI	60’ to 70’	150’ minimum for perennial streams; 100’ for intermittent streams

Intermittent Streams [ROD B-14>

Intermittent streams are defined as any nonpermanently flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria.

Including intermittent streams and wetlands within Riparian Reserves is important for successful implementation of the Aquatic Conservation Strategy. Accurate identification of these features is critical to the correct implementation of the

¹ Adapted from Douglas-fir “Site Index Table for Douglas-fir Dominant Trees” by Stabler (1944), as formerly shown in the Silvicultural Examination and Prescription Handbook, and the REO-approved document “Determination of Site-Potential Tree Heights for Riparian Reserve Widths (1995).

² Site index is the height of trees at age 100. Site index needs to be measured (or interpolated) for the riparian part of the stand, to achieve the desired riparian reserve “buffer” width. Use Douglas-fir site index table, without conversion, for all species.

³ This is equivalent to the site-potential tree height, one side, slope distance, for a single site tree height. (A site-potential tree height is the average maximum height of the tallest dominant trees, 200 years or older, for a given site class.) All reserve widths have a +/- 10% allowable variation (per REO approved document March 22, 1995). If it is a fish-bearing stream, double the riparian reserve “buffer” width.

strategy and protection of the intermittent stream and wetland functions and processes. Identification of these features is difficult at times due to the lack of surface water or wet soils during dry periods. The following discussion provides guidance on steps to identify these features for inclusion within Riparian Reserves.

Fish-bearing streams are distinguished from intermittent streams by the presence of any species of fish for any duration. Many intermittent streams may be used as spawning and rearing streams, refuge areas during flood events in larger rivers and streams or travel routes for fish emigrating from lakes. In these instances, the standards and guidelines for fish-bearing streams would apply to those sections of the intermittent stream used by the fish.

The following discussion pertains to Riparian Reserve widths on intermittent streams and wetlands necessary to meet Aquatic Conservation Strategy objectives. Other Riparian Reserve objectives, such as providing wildlife dispersal corridors, could lead to Riparian Reserve widths different than those necessary to protect the ecological integrity of the intermittent stream or wetland. These other objectives could yield wider Riparian Reserves than those necessary to meet Aquatic Conservation Strategy objectives. There can never be instances where Riparian Reserves would be narrower than the widths necessary to meet Aquatic Conservation Strategy objectives.

The width of Riparian Reserves necessary to protect the ecological integrity of intermittent streams varies with slope and rock type.

Watershed analysis provides the ecological and geomorphic basis for changing the size and location of Riparian Reserves.

The prescribed widths for Riparian Reserves apply to all streams, lakes, ponds and wetlands on lands administered by the Forest Service and BLM within the range of the northern spotted owl until a watershed analysis is completed. Watershed analysis is expected to yield the contextual information needed to define ecologically and geomorphically appropriate Riparian Reserves. Analysis of site-specific characteristics may warrant Riparian Reserves that are narrower or wider than the prescribed widths. Thus, it is possible to meet the objectives of at least the Aquatic Conservation Strategy portion of these standards and guidelines with post-watershed analysis reserve boundaries for intermittent streams that are quite different from those conforming to the prescribed widths. Regardless of stream type, changes to Riparian Reserves must be based on scientifically sound reasoning, and be fully justified and documented.

Wetlands

The combinations of hydrology, soils, and vegetative characteristics are the primary factors influencing the development of wetland habitats. There must be the presence of surface water or saturated soils to significantly reduce the oxygen content in the soils to zero or near zero concentrations. These low or zero soil oxygen conditions must persist for sufficient duration to promote development of plant communities that have a dominance of species adapted to survive and grow under zero oxygen conditions. These wetland characteristics apply when defining

wetlands for regulatory jurisdiction or for technical analysis when conducting inventories or functional assessments. Seeps and springs can be classified as streams if they have sufficient flow in a channel or as seasonal or perennial wetlands under the criteria defined in the 1987 Corps of Engineers “Wetlands Manual”. The standards and guidelines for wetlands, which are based on the hydrologic, physical and biologic characteristics described in the manual, apply to seeps and springs regardless of their size.

The formal definition for implementing section 404 of the Clean Water Act, adopted by the Environmental Protection Agency is:

The term wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Detailed technical methods have been developed to assist in identification of wetlands that meet the above definition. Currently, the field manual being used for implementing the Clean Water Act is the 1987 Corps of Engineers “Wetlands Manual.”

For purposes of conducting the National Wetland Inventory, the Fish and Wildlife Service has broadly defined both vegetated and nonvegetated wetlands as:

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes, (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Wetlands typically occur within and adjacent to riparian zones. It is frequently difficult to differentiate wetlands from riparian areas based on the definitions. Most typically, and particularly in forested landscapes, the riparian zone is defined by its spatial relation to adjacent streams or rivers. However, riparian zones are also commonly considered to be lands integrally related to other aquatic habitats such as lakes, reservoirs, intermittent streams, springs, seeps, and wetlands.

Because of such conceptual and definitional vagaries, there is spatial overlap between wetlands and riparian zones. This then results in only a portion of the riparian zone associated with rivers and streams being considered as wetlands. The extent of that portion will depend on the specifics of hydrologic, vegetation, and soil features. The functions of the wetland portion may also be distinct from the nonwetlands. For example, wetlands may provide habitat for specialized plant species or reproductive habitat for amphibians or other organisms that would not be provided by riparian areas.

Once the Riparian Reserve width is established, either based on existing widths or watershed analysis, then land management activities allowed in the Riparian Reserve will be directed by standards and guidelines for managing Riparian Reserves. The standards and guidelines for Riparian Reserves prohibit or regulate

activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. <ROD B-17]

Standards and Guidelines for Riparian Reserves [ROD C-31>

As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. Watershed analysis and appropriate NEPA compliance is required to change Riparian Reserve boundaries in all watersheds. Standards and guidelines for Riparian Reserves are included as a sub topic in the standards and guidelines for each resource or program area, where applicable. <ROD C-31]

Key Watersheds [ROD C-7>

Key Watersheds are not a designated area or Matrix, but overlay all of these allocations. All national forest lands within the range of the northern spotted owl are allocated to one of three watershed categories: Tier 1 Key Watersheds, Tier 2 Key Watersheds, or non-Key Watersheds (all others). Key Watersheds overlay portions of all six categories of designated areas and Matrix. Key Watersheds place the following additional management requirements: <ROD C-7]

[ROD B-19>

- Tier 1 Key Watersheds were selected for directly contributing to anadromous salmonid and bull trout conservation.
- Tier 2 Key Watersheds were selected as sources of high quality water and may not contain at-risk fish stocks
- No new roads will be built in roadless areas in Key Watersheds.
- Reduce existing system and nonsystem road mileage outside roadless areas. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds.
- Key Watersheds are highest priority for watershed restoration.
- Watershed analysis is required prior to management activities, except minor activities such as those Categorically Excluded under NEPA (and not including timber harvest).
- Timber harvest cannot occur in Key Watersheds prior to completing a watershed analysis. <ROD B-20]

[ROD B-18>

Refugia are a cornerstone of most species conservation strategies. They are designated areas that either provide, or are expected to provide, high quality habitat. A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat as well as areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have a high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program (see “Watershed Restoration” later in this chapter).

The Aquatic Conservation Strategy includes two designations for Key Watersheds. Tier 1 (Aquatic Conservation Emphasis) Key Watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Tier 1 Key Watersheds consist primarily of watersheds identified previously by the Scientific Panel on Late-Successional Forest Ecosystems (1991), and in the Scientific Analysis Team Report (1993). The network of Tier 1 Key Watersheds ensures that refugia are widely distributed across the landscape. While Tier 2 (other) Key Watersheds may not contain at-risk fish stocks, they are important sources of high quality water. <ROD B-18]

Long-term management within Key Watersheds requires watershed analysis prior to further resource management activity. In the short term, until watershed analysis can be completed, minor activities such as those that would be Categorically Excluded under National Environmental Policy Act regulations (except timber harvest) may proceed if they are consistent with Aquatic Conservation Strategy objectives and apply Riparian Reserves and standards and guidelines. Timber harvest, including salvage, can not occur in Key Watersheds without a watershed analysis. Key Watersheds that currently contain poor quality habitat are believed to have the best opportunity for successful restoration and will receive priority in any watershed restoration program (see “Watershed Restoration” on page 2-14).

Roadless Areas and Key Watersheds

Management activities in inventoried roadless areas with unstable land will increase the risk to aquatic and riparian habitat, impair the capacity of Key Watersheds to function as intended, and limit the potential to achieve Aquatic Conservation Strategy objectives. Standards and guidelines that refer to inventoried roadless areas (or simply “roadless areas”) apply only to those portions of such areas that would still qualify as roadless under the guidelines used to originally designate the areas under the second Forest Service Roadless Area Review and Evaluation (RARE II). Roadless areas on the Gifford Pinchot National Forest are described in Appendix C of the Forest Plan Final Environmental Impact Statement.

To protect the remaining high quality habitats, no new roads will be constructed in inventoried roadless areas in Key Watersheds. Watershed analysis must be conducted in all non-Key Watersheds that contain roadless areas before any management activities can occur within those roadless areas. (See Figure 6-1, “Steps to a Programmed Timber Sale.”)

The amount of existing system and nonsystem roads within Key Watersheds should be reduced through decommissioning of roads. Road closures with gates or barriers do not qualify as decommissioning or a reduction in road mileage. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds. That is, for each mile of new 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.

<ROD B-19]

Standards and Guidelines for Key Watersheds [ROD C-7>

Inside Roadless Areas - No new roads will be built in remaining unroaded portions of inventoried roadless areas.

Outside Roadless Areas - Reduce existing system and non-system road mileage. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in Key Watersheds.

Key Watersheds are highest priority for watershed restoration.

Watershed analysis is required prior to management activities, except minor activities such as those Categorically Excluded under NEPA (and not including timber harvest).

Watershed analysis is required prior to timber harvest. <ROD C-7]

Watershed Analysis [ROD B-20]

Watershed analysis, as described here, focuses on implementing the Aquatic Conservation Strategy. Watershed analysis is required in:

- Key Watersheds
- Roadless areas in non-Key Watersheds
- Riparian Reserves.

Decision makers require watershed analysis to determine how proposed land management activities will meet Aquatic Conservation Strategy objectives. Watershed analyses must be completed before initiating actions within a Key Watershed. There is a short term exception to this requirement for activities other than timber harvest. Minor activities that would be categorically excluded under National Environmental Policy Act regulations may proceed if they are consistent with Aquatic Conservation Strategy objectives, Riparian Reserves, and standards and guidelines.

Timber harvest, including salvage, cannot occur in Key Watersheds without a watershed analysis. Ultimately, watershed analyses should be conducted in all watersheds on federal lands as a basis for ecosystem planning and management.

Watershed analysis has a critical role in providing for aquatic and riparian habitat protection. Watershed analysis is important for planning ecosystem management and establishing Riparian Reserves. Watershed analysis considers the overall watershed condition including the protection and restoration of riparian and aquatic habitat. Watershed analysis considers an array of processes that include:

- the condition of the uplands
- the distribution and type of seral classes of vegetation
- the effects of previous natural and land-use related disturbances
- the distribution and abundance of species and populations
- the land use history.

These factors strongly influence the structure and functioning of aquatic and riparian habitat. Effective protection strategies for riparian and aquatic habitat on federal lands must accommodate the wide variability in landscape conditions present across the Pacific Northwest. Watershed analysis plays a key role in the Aquatic Conservation Strategy, ensuring that aquatic system protection is fitted to specific landscapes.

Watershed analysis focuses on collecting and compiling information within the watershed that is essential for making sound management decisions. It is an analytical process, not a decision-making process proposing an action requiring NEPA documentation. It serves as the basis for developing project-specific proposals, and monitoring and restoration needs for a watershed. Some analysis of issues or resources may be included in broader scale analyses because of their scope. The information from the watershed analyses contributes to decision making at all levels. Project-specific NEPA planning will use information

developed from watershed analysis. For example, if watershed analysis shows that restoring certain resources within a watershed could contribute to achieving landscape or ecosystem management objectives, then subsequent decisions will need to address that information. Watershed analysis is described in further detail in *A Federal Agency Guide for Pilot Watershed Analysis*. <ROD B-21]

[ROD B-30]

Summary of Aquatic Conservation Strategy for Watershed Analysis:

Watershed analysis is a systematic procedure to characterize watersheds. The information is used to guide management prescription and monitoring programs, set and refine Riparian Reserve boundaries, and develop watershed restoration projects.

- Required in Key Watersheds prior to resource management.
- Required in all roadless areas prior to resource management.
- Recommended in all other watersheds.
- Required prior to activities in Riparian Reserves.
- Required to change Riparian Reserve widths in all watersheds.
- Analyze earthflows, unstable and potentially unstable areas for inclusion within Riparian Reserves.
- Important in developing monitoring strategies.

Table 2-3 Watershed Analysis (WSA) Requirements Matrix

Roadless Area	Riparian Reserve	Key Watershed	WSA Required	Exceptions
Yes	Yes or No	Yes or No	Yes	None
No	Yes	Yes or No	Yes	1909.15, 31.1
No	No	Yes	Yes	1909.15, 31.1
No	No	No	No	1909.15, 31.2
No	No	No	No	NA

*Exceptions do not apply to any form of commercial timber harvest, including salvage.
 FSH 1909.15, 31.1 Categorically excludable without a project file or decision memo.
 FSH 1909.15, 31.2 Categorically excludable, but project file and decision memo required

Watershed Restoration

Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. Restoration will be based on watershed analysis and planning. Watershed analysis is essential to identify areas of greatest benefit-to-cost relationships for restoration opportunities and greatest likelihood of success. Watershed analysis can also be used as a medium to develop cooperative

projects involving various landowners. In many watersheds the most critical restoration needs occur on private lands downstream from federally managed lands. Decisions to apply a given treatment depend on the value and sensitivity of downstream uses, transportation needs, social expectations, risk assessment of probable outcomes for success at correcting problems, costs, and other factors. Watershed analysis, including the use of sediment budgets, provides a framework for considering benefit-to-cost relations in a watershed context. Thus, the magnitude of restoration needs within the planning area will be based on watershed analysis.

The most important components of a watershed restoration program are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity. Other restoration opportunities exist, such as meadow and wetland restoration and mine reclamation, and these may be quite important in some areas. Regionally however, these opportunities are much less extensive than the three components listed above.

Roads

Road treatments range from full decommissioning (closing and stabilizing a road to eliminate potential for storm damage and the need for maintenance) to simple road upgrading, which leaves the road open. Upgrading can involve practices such as removing soil from locations where there is a high potential of triggering landslides, modifying road drainage systems to reduce the extent to which the road functions as an extension of the stream network, and reconstructing stream crossings to reduce the risk and consequences of road failure or washing out at the crossings.

Riparian Vegetation

Active silvicultural programs will be necessary to restore large conifers in Riparian Reserves. Appropriate practices may include planting unstable areas such as landslides along streams and flood terraces, thinning densely-stocked young stands to encourage development of large conifers, releasing young conifers from overtopping hardwoods, and reforesting shrub and hardwood-dominated stands with conifers. These practices can be implemented along with silvicultural treatments in upland areas, although the practices will differ in objective and, consequently, design.

In-Stream Habitat Structures

In-stream restoration, based on the interpretation of physical and biological processes and deficiencies during watershed analysis, can be an important component of an overall program for restoring fish and riparian habitat. In-stream restoration measures are inherently short term and must be accompanied by riparian and upslope restoration to achieve long-term watershed restoration. Maintaining desired levels of channel habitat complexity, for example, may best be achieved in the short term by introducing structures. However, a riparian area with the

complete array of functions and processes should provide coarse woody debris to the channel in the long term.

In-stream restoration will be accompanied by riparian and upslope restoration if watershed restoration is to be successful. In-stream restoration, including in-channel structures, will not be used to mitigate for management actions that degrade existing habitat, as a substitute for habitat protection, or to justify risky land management activities and practices. Priority must be given to protecting existing high quality habitat.

Summary of Aquatic Conservation Strategy for Watershed Restoration:

- Watershed restoration restores watershed processes to recover degraded habitat.
- Watershed restoration should focus on removing and upgrading roads.
- Silvicultural treatments may be used to restore large conifers in Riparian Reserves.
- Watershed restoration should restore channel complexity. In-stream structures should only be used in the short term and not as a mitigation for poor land management practices.

Watershed Analyses Status

Sixteen watershed analyses have been completed to date and are listed below with their dates of publication. The remaining five watersheds analyses are expected to be completed in 1998.

<u>Watershed</u>	<u>Date</u>	<u>Watershed</u>	<u>Date</u>	<u>Watershed</u>	<u>Date</u>
Middle and Upper Cispus River	6/95	Lower Cispus West	3/96	Lower Cispus East	4/96
Middle Cowlitz River	2/97	Upper Cowlitz River	6/97	Upper North Fork Lewis River	2/95
Middle North Fork Lewis River	7/95	East Fork Lewis River	12/95	Lower North Fork Lewis River	7/96
Muddy River	5/97	Kalama River	9/96	Upper White Salmon River	2/95
Little White Salmon River	9/95	Wind River	4/96	Cave-Bear Creek	7/97
Trout Lake Creek	9/96	Toutle River	9/97	Nisqually River	_/98
Clear Fork Cowlitz River	_/98	White Salmon River East	_/98	Rock Creek	_/98
Tilton River	_/98				

Monitoring

The following monitoring section is specific to achieving the stated objectives of the Aquatic Conservation Strategy.

Watershed analysis will support decisions for a variety of planned ecosystem management actions within watersheds. Specific actions may include habitat restoration, sediment reduction programs, road removal and management, timber harvesting, development of a recreation facility, or any of a multitude of activities. Monitoring will be an essential component of these management actions and will be guided by the results of watershed analysis.

General objectives of monitoring will be to:

- (1) determine if Best Management Practices have been implemented,
- (2) determine the effectiveness of management practices at multiple scales, ranging from individual sites to watersheds, and
- (3) validate whether ecosystem functions and processes have been maintained as predicted. In addition, monitoring will provide feedback to fuel the adaptive management process.

Monitoring plans must be tailored for each watershed. Significant differences in type and intensity of monitoring will occur based on watershed characteristics and management actions. For example, carefully targeted restoration activities may only require effectiveness monitoring of single activities, whereas watershed-scale restoration would be accompanied by extensive riparian and in-stream monitoring. The specific design of monitoring programs can best be accomplished by the local interdisciplinary teams working in cooperation with state programs. Pooling the monitoring resources of federal and state agencies is a necessity to provide interagency consistency and to increase available resources.

Monitoring will be conducted and results will be documented, analyzed and reported by the agency or agencies responsible for land management in any particular watershed. Reports will be reviewed by local interdisciplinary teams. In addition, water resource regulatory agencies may review results to determine compliance with appropriate standards and province and river basin-level strategies. A cross-section of team members that includes participants from states and regulatory agencies should assess monitoring results and recommend changes in Best Management Practices or the mechanisms for Best Management Practice implementation. <ROD B-34]

Resource and Program Area Direction

The remainder of this chapter contains standards and guidelines which apply to all land allocations. Direction is organized by resource areas such as wildlife or fish, or program area such as the Facilities. Standards and guidelines specific to Riparian Reserves are included in each section, where applicable.

Facilities [FP IV-65>

Facilities include roads, buildings, and related structures required for management of National Forest Lands.

Transportation Planning and Inventory

1. In determining road density and design standards, the goal should be to design and construct or decommission roads appropriate to the intended uses, considering safety, cost of transportation, innovative logging systems, and impacts on other resources.

The development, maintenance, and management of the Forest development road system is to continue as needed to respond to resource management objectives.

2. All new roads constructed which are planned for closure should be designed with a turnaround/parking area as a standard road design criteria. Turnaround/parking areas, gates, barriers, and signs should be funded as part of the initial road package. Gates should be installed and closures put into effect upon completion of construction whenever possible.

Road, Bridge, and Culvert Construction and Reconstruction

1. All crossing projects affecting streams used for spawning, rearing, or migration on a year-round or permanent basis stream will be coordinated with Washington State Department of Fish and Wildlife. The streams crossed by such projects will be evaluated prior to project work to determine impact upon fisheries. (Refer to “Riparian Reserve Standards and Guidelines for Road Management” on page 2-22.)
2. Construction or maintenance work crossing fishbearing streams will be located and timed to protect spawning and egg incubation.
3. Following construction work, erosion control and restoration will be completed during the same season, or as soon as possible.

Road Operation

1. Traffic service levels should be established with consideration of resource management objectives, economics, traffic volumes, traffic mix, and safety.

2. Arterial and major collector roads should be managed for a mix of passenger cars and/or high-clearance vehicles and commercial traffic and should meet the standards set for roads subject to the Highway Safety Act (PL89-564).
3. Minor collector and local roads should be managed for standard passenger cars and/or high-clearance vehicles use only if there is a specific recreation access requirement, such as some campgrounds and major trailheads. Otherwise, they should be managed for other resources and should not be maintained for public travel. (Refer to the Access and Travel Management Plan for more specific direction).
4. The assigned traffic service level for minor collector and local roads should be consistent with the road management objectives for the area. The intent is to manage roads in a manner consistent with the resource objectives for each management area, while maintaining a reasonably uniform service level for the entire route as it passes through several management areas.
5. The "Access and Travel Management Plan" provides guidelines for the proper mix of development, road management, and maintenance of the road system. This Plan incorporates management programs such as the Commercial Road Rules, Road Maintenance Plan, Road Share-Cost Agreements, Forest Sign Guide, Forest Travel Plan, and Road Management Objectives.
6. The "Access and Travel Management Plan" will provide information on where public travel is permitted or limited. The Travel Plan should be reviewed and revised, as necessary, to reflect Forest Plan objectives.
7. The Flood Emergency Road Maintenance Plan (FERM) should be updated annually.
8. Roads not required for resource use, protection, or some other demonstrated access need should be closed or decommissioned. Access needs and road closures should be addressed in the Road Management Objectives for the road and in the Access and Travel Management Plan.
9. Road closures should use the fewest barriers to reduce traffic over the largest possible area. For wildlife purposes, closure priorities should consider the location of important wildlife habitat, the amount of forest cover present, the proximity of riparian habitat, and the existing degree of visibility. Effective enforcement capability is essential in the design of road closures. Area closures should be considered where off-road vehicle (ORV) use of primitive roads, or "wheel tracks," are disturbing or displacing wildlife.
10. Management activities within one-half mile of Wilderness or Semi-Primitive areas should be sensitive to the need for a feeling of remoteness or isolation within those areas. Timing of activities and access limitations may be considered in management areas adjacent to those areas.
11. Road closures designated in the Road Management Objective process should be accomplished within one year after the resource activity concludes when applying

the Eliminate or Prohibit traffic management schemes. When resource conflicts are minimal, the Discourage traffic scheme may be used to allow a road to close itself.

12. Forest Roads 25 and 99 should be open for public travel, providing access to the National Volcanic Monument from Memorial Day until closed by winter snows.
13. All nonsystem roads constructed in the planning period must be obliterated and revegetated using native species when possible when no longer needed for resource management.
14. Within the biological deer and elk winter range, roads not needed for access to an active project or to provide access to a recreation destination should be either decommissioned or permanently or seasonally closed to reduce wildlife disturbance.
15. Major through routes and roads providing access to a specific major recreation destination should be managed to accommodate passenger car traffic. <FP IV-67]

Road Management Schemes [FP IV-85]

The following is the summary of the Road Management System applicable to all management areas with road access.

Roads Subject to Highway Safety Act

Major Forest roads, such as arterials and major collectors, are managed to accommodate general public travel in standard four-wheel passenger cars. They are subject to the requirements of the Highway Safety Act (PL89-564). These roads are operated at traffic service Levels A and B and, infrequently, at Level C. Maintenance will be at Levels 3, 4, and 5. These roads, by definition, should be open to the general public without restriction except for seasonal or intermittent closures.

1. *Encourage Passenger Cars*: This management scheme invites and encourages standard four-wheel passenger car use. Destination, directional, regulatory, and warning signs should be installed and well maintained. Other forms of traffic control devices such as pavement striping will also invite public use. These routes are generally arterial and major collector routes and are portrayed as primary Forest roads on the Forest recreation map.
2. *Accept Passenger Cars*: This management scheme is to allow passenger car use on collector roads that generally have gravel surfacing and may not be open year-round. These are indicated as secondary Forest development roads on the recreation map. Warning, regulatory, and route markers are the only necessary roadside signing.
3. *Discourage Passenger Cars*: This scheme is used on an intermittent or seasonal basis to discourage public use. It is most often applied when a road is temporarily not suitable for travel, such as during times of deep snow. Warning signs are posted to dissuade the public from using the road.

4. *Prohibit Passenger Cars:* Main roads can be closed to provide for public safety or for the protection of resource values by issuing a CFR closure order prohibiting public use. This management scheme may be applied during volcanic activity, floods, avalanche hazard periods, or when there is structural damage to bridges or roads.

Roads not Subject to the Highway Safety Act

Forest development roads not intended to be operated or maintained for standard passenger car use are exempt from the requirements of the Highway Safety Act. These are generally maintained for traffic only during commercial activities such as timber management, mineral exploration and extraction, and range management.

These minor collector and local roads are generally operated at traffic service level C or D and maintained at levels 1 or 2 when not being used for timber haul. During timber haul the surface maintenance frequently appears to be upgraded to a maintenance level 3. Surface maintenance is not required to be consistent with the assigned maintenance level for the road since the objective is to discourage or to limit passenger car use.

1. *Encourage High Clearance Vehicles:* The objective is to encourage high clearance vehicles, such as pickup trucks or jeeps, and to discourage passenger cars. These roads are maintained at level 2 and are indicated on the recreation map. Destination or guide signs, such as to some trailheads or special features, are posted at their entrances. The emphasis for accomplishing this traffic scheme is through road entrance management.

These roads will have one or two cross ditches across the road, or the main road's roadside ditch might continue across the junction of the lesser road. Signs discouraging passenger cars are sometimes used if more emphasis is needed beyond the cross ditches. When Encourage High Clearance Vehicle roads intersect with paved main roads, the edge line stripe along the main road will continue through the intersection.

2. *Accept High Clearance Vehicles:* The objective is to accept high clearance vehicles and to discourage passenger cars. These roads are maintained at Level 2 and are available and adequate for administrative use. Some public use may occur until passage becomes unsafe or resource damage becomes unacceptable. At that time the road management scheme usually changes to Prohibit or Eliminate.

In addition to the cross ditches at the entrances of these roads, all directional or guide signs will be removed to further discourage recognition and use of the road.

3. *Discourage High Clearance Vehicles:* The objective is to discourage all public use. The road entrances are designed to discourage four-wheel vehicle users with advisory signs, warning signs, or barriers. The maintenance level may vary depending on what permitted project use is occurring. Generally, the long-term maintenance level will be at the low tolerance of level 2.

The maintenance emphasis allows roadside vegetation to encroach to the minimum width required for passage and allows naturally deposited materials such as rocks, limbs, and logs to remain on the roadway. Installation of closed unlocked gates or other removable barriers is permissible if a proper message is posted explaining why public use is discouraged.

4. *Eliminate High Clearance Vehicles:* The objective is to eliminate all use of four-wheel vehicles over 40 inches in width. This is accomplished by physically blocking the road rather than relying on regulations. These roads are maintained at level 1 and only to prevent resource damage. Some methods of blocking entrances include guard rail-type barriers, logs, stumps, concrete barriers, false road cuts, boulders, earthen mounds, deep trenches, and a combination of these barriers. Camouflaging with brush or trees is sometimes used to conceal the entrance of these roads. Gates are not included within this management scheme.

Trail vehicles of less than 40 inches in width can still use these roads unless a CFR order is issued prohibiting such use.

5. *Prohibit High Clearance Vehicles:* The Prohibit management scheme removes all or some of the road users by force of law if the road restriction is posted on the road and a CFR order is issued. Some users can be denied use while others are permitted depending on the management objectives for a road and how the CFR order is written. Locked gates may be used in this traffic management scheme.

The maintenance level for these roads can vary between levels 2 and 1. Roads having this scheme will be displayed on the Forest Travel Plan Map. <FP IV-86]

Riparian Reserve Standards and Guidelines for Roads Management

[ROD C-32>

1. Federal, state and county agencies should cooperate to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.
2. For each existing or planned road, meet Aquatic Conservation Strategy objectives by:
 - a) minimizing road and landing locations in Riparian Reserves.
 - b) completing watershed analyses (including appropriate geotechnical analyses) prior to construction of new roads or landings in Riparian Reserves.
 - c) preparing road design criteria, elements, and standards that govern construction and reconstruction.
 - d) preparing operation and maintenance criteria that govern road operation, maintenance, and management.

- e) minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
 - f) restricting sidecasting as necessary to prevent the introduction of sediment to streams.
 - g) avoiding wetlands entirely when constructing new roads.
3. Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by:
- a) reconstructing roads and associated drainage features that pose a substantial risk.
 - b) prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.
 - c) closing and stabilizing or obliterating and stabilizing roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.
4. New culverts, bridges and other stream crossings shall be constructed, and existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.
5. Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hill slopes.
6. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.
7. Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Aquatic Conservation Strategy objectives. As a minimum, this plan shall include provisions for the following activities:
- a) inspections and maintenance during storm events.
 - b) inspections and maintenance after storm events.
 - c) road operation and maintenance, giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources.
 - d) traffic regulation during wet periods to prevent damage to riparian resources.
 - e) establish the purpose of each road by developing the Road Management Objective. <ROD C-33]

Construction and Facility Maintenance [FP IV-67>

1. Construction or maintenance work crossing fishbearing streams will be located and timed to protect spawning and egg incubation.
2. Following construction work, erosion control using native species when possible and restoration will be completed during the same season, or as soon as possible.
3. Alteration or maintenance of designated historic structures requires a site development plan and must be performed in consultation with the State Historic Preservation Office.
4. Buildings, utility systems and related facilities should be planned, developed, maintained and operated for safe use, support of Forest resource programs, and cost effectiveness.

The construction of new buildings or additions to existing buildings and utility systems shall comply with the approved site development plan. <FP IV-67

Heritage Resources Program [FP IV-20>

The ultimate goal of the heritage resources program will be the protection use and/or interpretation of appropriate heritage resource properties for the benefit of the general public.

All heritage resource sites will be evaluated prior to any potential project impact. Monitoring for other impacts, such as erosion and vandalism, will occur.

Depending on available funding, priorities for nonproject-related heritage site inventory will be:

1. Areas which are being impacted by natural processes or intensive public use.
2. Areas with reported but unverified sites.
3. Areas where heritage resources are highly probable as determined by known land use patterns, terrain features, resource distributions, and the nature and extent of previous landscape modifications.

All sites located during a project-related survey will be documented in accordance with Regional standards. The heritage site inventory will serve to:

1. Aid in the development of a database which can reliably contribute to statewide efforts in preservation planning.
2. Facilitate the development of appropriate research strategies.
3. Provide the basis for evaluations of significance.
4. Aid in the formulation of informed management decisions.

Sites will be treated as individual properties, thematic groups, or historic districts. The major emphasis, however, will be away from the evaluation of single sites. No property can be viewed in isolation when assessing its importance. Efforts will be made to look at

the local or regional context of the heritage resource and to determine the relationship of the property to others within the same historic context and/or specific geographic area.

In the case of archaeological sites on the Forest, some test excavations will be necessary to determine the boundaries, depth of deposits, and/or basic nature and condition of the properties. This information is vital to determining the extent and significance of these sites.

Preferred management of heritage resources is protection in place through avoidance, stabilization, and maintenance of the environmental setting.

All inventoried sites will be assessed as to suitability for interpretation or appropriateness for scientific research. Coordination with the American Indian community may be necessary. Involvement of interested volunteer groups and appropriate educational institutions will be encouraged.

Native American traditional uses will be considered, and traditional cultural properties inventoried as a class of heritage resources.

The Handshake Agreement between Chief Yallup and Forest Supervisor Bruckert granting Native Americans exclusive berrypicking rights to a 700 acre portion of the Sawtooth Berryfield east of Forest Road 24 will continue to be honored. < FP-IV-21]

[FP-IV-49>

The following Cultural Resource Management standards and guidelines will be used to ensure that the necessary planning, inventory, evaluation, assessment, and protection (or mitigation of effects) is carried out for all cultural resources.

Heritage Resource Planning

1. A heritage resource management plan will be written for each Federally-owned site listed on, or determined eligible for, the National Register of Historic Places, including those under special use or Granger-Thye permit.
2. A management plan should be written for the Forest heritage resource program. The plan should include recommendations for enhancement and interpretation of heritage resources, as well as recommendations for generating use fees.

Heritage Resource Inventory

1. Prior to any ground-disturbing activity, proposed project areas will be examined for heritage resources by a heritage resource specialist or technician under the direction of a specialist. Included are: (1) those projects which are permitted, but not performed by the Forest Service, and (2) Forest Service projects on other than National Forest lands. The inventory will be conducted as early as feasible in the project planning stage, and results will be documented in the Environmental Analysis for the project.
2. A heritage resource inventory will be conducted prior to the routine maintenance, rehabilitation, movement, or removal of any structure which may have cultural

value. Included are those privately owned on National Forest lands under special use permits.

3. An inventory to identify all reasonably locatable heritage resources on National Forest lands should be completed within ten years after approval of this Forest Plan.
4. Heritage resource inventory work will be coordinated with the State Historic Preservation Officer through the Forest Cultural Resource Specialist.
5. The Forest “Cultural Resource Overview” should be updated as needed.
6. Caves, rock shelters, lava tubes, and talus slopes will be inventoried when they are within project areas or are subject to recreational use. Refer to standards and guidelines for caves under “Caves and Geologic Features” later in this chapter.
7. An inventory will be kept of sites identified by Native Americans under the American Indian Religious Freedom Act.

Cultural Resource Evaluation and Assessments

1. All cultural resources, including sites and structures, will be evaluated to determine eligibility for the National Register of Historic Places. If determined eligible, they will be managed as if listed on the Register. The State Historic Preservation Officer will be consulted when determining eligibility, with the Keeper of the National Register consulted as needed. Sites or structures determined to be eligible for the Register will be nominated.
2. The potential effects of proposed activities on any cultural resource will be assessed prior to any disturbances. Assessment will be performed in consultation with the State Historic Preservation Officer (SHPO) and the Federal Advisory Council on Historic Preservation.

Cultural Resource Management, Protection, and Enhancement

1. Cultural resources eligible for the National Register will be protected from potential effects of project activities or their historic values conserved through appropriate mitigation.
2. Cultural resources eligible for the Register will be protected from depredation due to public use and natural deterioration.
3. Measures to avoid or mitigate project effects and to protect cultural sites and structures will be developed in consultation with the State Historic Preservation Officer and the Federal Advisory Council on Historic Preservation.
4. Federally-owned historic buildings not in use should be considered for special use permits or Granger-Thye permits.
5. Suitable cultural resources should be developed and interpreted for recreational use when adequate provisions are available to protect the resource.

6. Information gathered in the evaluation of sites and structures should be used in the Forest interpretation program. Displays, brochures, interpretive trails, or signing may be employed.
7. Specific cultural resource site locations are exempt from disclosure to the general public.
8. All cultural resource inventories and excavations by non-Forest Service personnel will require a permit.
9. Rights and privileges provided by the Medicine Creek Treaty of 1854 for the Nisqually, Puyallup, Squaxin Island, and Steilacoom Indian Tribes (including (1) the right of taking fish at usual and accustomed grounds and stations in common with all citizens, and erecting temporary houses for curing, (2) the privilege of hunting and gathering roots and berries on lands under U.S. administration, and (3) the privilege of pasturing their horses on lands under U.S. administration) and the Yakima Treaty of 1855 for the Yakima Indian Nation will be reserved for those groups. Within Treaty areas, resource management plans will be coordinated with these Tribes.
10. Outside of Treaty areas, resource management plans should be coordinated with local Tribes where appropriate.
11. Outside and within Treaty areas, traditional food and plant material gathering sites used by Native Americans may be managed for continued production of native roots, berries, nuts, herbs, beargrass, and other plant materials typically gathered from the land. <FP-IV-50 [ROD - 54]>

It is conceivable, however, that subsequent implementation of standards and guidelines could directly affect American Indian practices and activities—for example, a prohibition against the collection of certain plant material or trees in Late-Successional Reserves that are subject to tribal treaty off-reservation gathering rights. Under such circumstances, the exercise of these tribal rights will not be restricted unless the Regional Interagency Executive Committee determines that the restriction is (1) reasonable and necessary for preservation of the species at issue, (2) the conservation purpose of the restriction cannot be achieved solely by regulation on non-Indian activities, (3) the restriction is the least restrictive alternative available to achieve the required conservation purpose, (4) the restriction does not discriminate against Indian activities either as stated or as applied, and (5) voluntary tribal conservation measures are not adequate to achieve the necessary conservation purpose.

Consultation with the recognized tribal government with jurisdiction over the trust property that the proposal may affect, the Bureau of Indian Affairs, and the Office of the Solicitor will be conducted early in the planning process. The consultation with affected tribes will occur on a government-to-government basis. Conflicts will be resolved collaboratively with affected tribes involved in the planning process, consistent with the federal government's trust responsibilities. <ROD - 55 [FP IV-50]>

12. Religious sites and resources identified under the American Indian Religious Freedom Act will be managed in consultation with Native Americans.
13. Existing and potential historic structure maintenance will be identified and reviewed annually.
14. Newly identified peeled cedar sites will be protected with a 200-foot buffer until placed in one of the following categories:
 - a) Preservation - The site will be protected with a 200-foot buffer.
 - b) Available for harvest - Mitigation will occur before the site is released for harvest.

Continuing management of peeled cedar sites will be done under the Peeled Cedar Management Plan and Programmatic Memorandum of Agreement with the State Historic Preservation Office and Advisory Council on Historic Preservation.

15. The “1932 Handshake Agreement” between Chief Yallup and Forest Supervisor Bruckert granting Native Americans exclusive berrypicking rights to a portion of the Sawtooth Berryfields east of Forest Road 24 will continue. <FP IV-50]

Lands and Minerals

Special Use Permits (Nonrecreation) and Right-of-Way Grants for Roads and Trails [FP IV-64]

The standards and guidelines under this heading are in response to requests for permits, or other approval, from persons, organizations, or agencies outside the Forest Service.

1. Uses without permits should be inventoried and terminated if found to be inconsistent with the objectives of the management area. New permits should be limited to those which do not conflict with management area objectives.
2. Utility Corridors are excluded from consideration in Wildernesses, the National Volcanic Monument, and Wild Rivers upon Congressional designation under the Wild and Scenic Rivers Act. Corridors should be avoided in the following areas:
 - a) Rivers proposed for designation as Wild Rivers
 - b) Scenic and proposed Scenic Rivers
 - c) Research Natural Areas
 - d) Riparian Reserves
 - e) Threatened, Endangered, and Sensitive Species Habitats
 - f) Special Interest Areas
 - g) Developed Recreation Sites
 - h) Unroaded Recreation
 - i) Wildlife Special Areas
 - j) Mountain Goat Habitat
 - k) Experimental Forest.

3. Permits, leases, and rights-of-way not consistent with the objectives of the management area should not be recommended. Nonconforming uses should be terminated when opportunity permits.
4. New utility proposals should be accommodated within existing designated utility sites or corridors to the maximum extent feasible. <FP IV-64]

Property Boundary Location

Property and Congressionally designated area boundaries will be located prior to any management activity which may affect these areas. For timber sales, the boundary should be located and marked at least two years before the sale.

Landownership Planning

All lands within the Forest boundary, public and private, are assigned to one of five landownership categories, depending upon their location and mix of resource values. These assignments are intended to serve as a guide for the Forest's ongoing land exchange/ownership adjustment program. The five categories are:

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|--------------|---|
| Category I | Retention of public lands or acquisition of lands in other ownerships is essential. |
| Category II | Retention or acquisition as opportunity occurs, needed to benefit special areas or needs. Public ownership is beneficial. |
| Category III | Neutral lands available for acquisition or disposal. Public ownership not essential. |
| Category IV | Lands to be disposed of, or lands not expected to be acquired such as homes, lands. Public ownership is not beneficial. |
| Category V | More study is needed to determine proper category. |

Rights-of-Way Acquisitions and Cost-Share Agreements

(R/Ws in-service generated, cost-share agreements normally in-service)

1. Rights-of-way and cost-share agreements required for timber sales projects will be:
 - a) Identified in the position statement or project initiation letter for the proposed sale.
 - b) Completed through the preliminary title search in the Environmental Assessment.
 - c) Approved, with rights-of-way package in the Timber Sale Report or prior to project implementation.

2. General rights-of-way should:
 - a) Be identified early to allow choice of location with least impact on Forest and involved landowner.
 - b) Be complete through preliminary title search before design engineering commences.
 - c) Secure approval of rights-of-way package before easement is used.

3. Existing Rights-of-way:
 - a) Review each case to determine the adequacy of rights received in the deed.
 - b) Acquire necessary additional interests in existing road and trail rights-of-way to meet Forest objectives.
 - c) Aggressively pursue the resolution of access rights on roads and trails which are presently on the National Forest Transportation System.<FP IV-65]

Riparian Reserve Standards and Guidelines for Lands [ROD C-37>

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|------|---|
| LH-1 | Identify in-stream flows needed to maintain riparian resources, channel conditions, and fish passage. |
| LH-2 | Tier 1 Key Watersheds: For hydroelectric and other surface water development proposals, require in-stream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to the Federal Energy Regulatory Commission (FERC) that require flows and habitat conditions that maintain or restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate state agencies. |

For all other watersheds non-Tier 1: For hydroelectric and other surface water development proposals, give priority emphasis to in-stream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to FERC that emphasize in-stream flows and habitat conditions that maintain or restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate state agencies.

- LH-3 Locate new support facilities outside Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management, provide recommendations to FERC that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, provide recommendations to FERC that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves will be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.
- LH-4 Issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective, eliminate the activity. Priority for modifying existing leases, permits, rights-of-way and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.
- LH-5 Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction. <ROD C-37]

[FP IV-74>

Activities requiring special use permits should be located outside the Riparian Reserve. Necessary activities in Riparian Reserves may be allowed, providing their impact on riparian values is not significant or permanent. <FP IV-74]

Minerals Management [FP IV-64>

Areas with mineral potential should be recommended for mineral entry withdrawal only when mitigation measures would not adequately protect other resources and when such resources are determined to have greater public values. In most cases, PL 84-167 (Multiple Use of Surface of Public Land), 36 CFR 228 and 36 CFR 261 will provide adequate protection of surface resources. Subject to valid existing rights, withdrawals from entry under the general mining law will be in conformance with Section 204 of PL 94-579 (Federal Land Policy and Management Act). <FP IV-64]

Riparian Reserve Standards and Guidelines for Minerals Management

[ROD C-34>

- MM-1 Require a reclamation plan, approved Plan of Operations, and reclamation bond for all minerals operations that include Riparian Reserves. Such plans and bonds must address the costs of removing facilities, equipment, and materials; recontouring disturbed areas to near pre-mining topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvage and replacement of topsoil; and seedbed preparation and revegetation to meet Aquatic Conservation Strategy objectives.
- MM-2 Locate structures, support facilities, and roads outside Riparian Reserves. Where no alternative to siting facilities in Riparian Reserves exists, locate them in a way compatible with Aquatic Conservation Strategy objectives. Miles of road construction will be kept to the minimum necessary for the approved mineral activity. Such roads will be constructed and maintained to meet roads management standards and to minimize damage to resources in the Riparian Reserve. When a road is no longer required for mineral or land management activities, it will be closed, obliterated, and stabilized.
- MM-3 Prohibit solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Reserves exists, and releases can be prevented, and stability can be ensured, then:
- a) analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.
 - b) locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Reserves.
 - c) monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.
 - d) reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.
 - e) require reclamation bonds adequate to ensure long-term chemical and physical stability of mine waste facilities.

- MM-4 For leasable minerals, prohibit surface occupancy within Riparian Reserves for oil, gas, and geothermal exploration and development activities where leases do not already exist. Where possible, adjust the operating plans of existing contracts to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives
- MM-5 Salable mineral activities such as sand and gravel mining and extraction within Riparian Reserves will occur only if Aquatic Conservation Strategy objectives can be met.
- MM-6 Include inspection and monitoring requirements in mineral plans, leases or permits. Evaluate the results of inspection and monitoring to effect the modification of mineral plans, leases and permits as needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives. <ROD C-36]

Caves and Geologic Features [FP IV-62]

1. The Forest's "Geologic Resource Inventory" and "Geologic Resources and Condition Map" will be used to assess the impact of those management activities affecting the geologic resource.
2. Inventories and investigations should be conducted for mineral potential to minimize conflicts with possible future mineral development and other Forest activities. The Mineral Potential Map will be used to assess the impacts of management activities. Mineral resources will be considered in proposals for planning, withdrawals, exchanges, and any development project.
3. Caves will be evaluated as required by the Federal Cave Resources Protection Act of 1988. Caves determined to be significant under the Act will be considered for listing on the National Significant Caves List. Specific locations of Significant Caves are exempt from disclosure to the general public.
4. A Forest-wide, comprehensive cave management analysis should be completed within ten years after approval of the Forest Plan. Management plans should be prepared for caves with high resource, educational, or recreational values, hazardous conditions, or heavy use. If the analysis determines that cave management or protection is required, the cave should be placed in one of the following classes. Caves determined through analysis to have no significant values, and documented as such, will no longer be protected.
 - a) Class 1: Sensitive Caves

Caves considered unsuitable for exploration by the general public either because of their pristine condition, unique resources, or extreme safety hazards. They may contain resources that would be impacted by low levels of visitation. These caves are not shown on maps or discussed in publications intended for general public use such as guides, brochures, and magazines.

- b) Class 2: Directed Access Caves0

Caves with directed public access and developed for public use. These caves are shown on maps or have signs directing visitor access; they frequently have guided tours and artificial lighting. Regardless of the level of development, public visitation is encouraged. The caves may have sensitive resources that are protected.
 - c) Class 3: Undeveloped Caves

Caves that are undeveloped or contain unmaintained or minimal developments that are suitable for exploration by persons who are properly prepared. In general, these caves contain resources that resist degradation by recreational use. However, public use will not be directed toward them.
5. Prior to a determination of significance under the 1988 Cave Act, or Forest-wide comprehensive cave management analysis, the following direction is applicable:
- Prior to ground-disturbing activities which may adversely affect them, an analysis should be prepared for caves and similar unique geological features. The analysis should document any biological, hydrological, cultural, recreational, geological, mineralogical, paleontological, educational, or scientific values. The following measures may be used to protect caves and similar geologic features:
- a) Limitation of logging, road construction, and other uses of heavy equipment above or in the vicinity of a cave with a thin roof, or the course of such a cave, if there is a potential for damage.
 - b) Retention of vegetation in the vicinity of a cave or cave course, if it is required, to protect the cave's micro environment.
 - c) If timber harvesting is permitted in the vicinity of a cave, trees may be directionally felled away from the cave and its course.
 - d) Avoidance of the alteration of cave entrances, or their use as disposal sites for slash, spoils, or other refuse.
 - e) Limitation of management activities within any area draining into a cave if they may affect the cave ecosystem with sedimentation, soil sterilization, the addition of nutrients or other chemicals, including pesticides, herbicides, and fertilizers, or change the cave's natural hydrology.
 - f) Avoidance of diversion of surface drainage into caves.
 - g) Limitation of public access, if required to prevent damage to the cave resources or if there are unusual safety hazards.
 - h) Avoid advertising the location of caves to the general public in printed documents or by signing.
 - i) Scientific or educational use of caves may be permitted by the Forest Supervisor.

- j) Also see “Habitat Management Objectives for Bats,” later in this chapter.

Processing of Exploration Proposals, Lease Applications, and Site Development Proposals

(The standards and guidelines under this heading are in response to requests for permits, or other approval, from persons, organizations, or agencies outside the Forest Service).

1. Under the mining law, claimants are entitled to access to their mining claims. Access for exploration and development of locatable mineral resources will be analyzed in response to a proposed operating plan. A decision on approval of reasonable access will be made as a result to appropriate environmental analysis.
2. Operating plans will include reasonable and operationally feasible requirements for timely and effective coordination with other resources.
3. Reclamation plans should describe final management objectives for specific mined areas and detail reasonable procedures and time frames to accomplish those objectives. Reclamation bonds will be based on actual reclamation costs and formulated using appropriate technical and other resource input.
4. Mining claimants should be notified of impending Forest Service actions that may affect their claims. Reasonable efforts should be made to protect claim corners and mine workings from disturbance as a result of Forest Service activities.
5. Mineral lease applications will be reviewed in a timely fashion and conditions and appropriate special stipulations necessary to protect surface resources will be applied.
6. A “No Surface Occupancy” stipulation will be applied to leases only (a) when surface occupancy would cause significant resource disturbance which cannot be mitigated by any other means, (b) where resource impacts would be irreversible or irretrievable, or (c) when the activity is incompatible with the surface management objectives.
7. The development of common variety mineral material sources will be evaluated and administered according to the Forest’s “Rock Resource Management Plan.”

<FP IV-64]

Protection [FP IV-67>

Fire Management Planning and Analysis

Forest-wide planning will utilize the National Forest Management Analysis System to determine the most cost-efficient fire protection organization. As conditions change and better information is developed, the fire organization will be re-evaluated with this system.

Cost-effective plans for the prevention of human-caused fires will be aimed at specific risks determined by ongoing monitoring of current and recent fire reports.

The mix of aerial and ground detection activities will be reviewed periodically to maintain the most cost-efficient combination.

Escaped Fire Suppression

1. Suppression decisions will be based on an Escaped Fire Situation Analysis (FS-5100-Z). This analysis will be made for all escaped fires when:
 - a) A fire has escaped initial attack or has been determined to exceed the protection objectives of the area.
 - b) Alternative suppression strategies can be identified before large expenditures in time or money are incurred.
 - c) The fire will extend into the next burning period.
2. Alternative Suppression Strategies which should be considered are:
 - a) *Confine*: To restrict the fire within boundaries established either prior to the fire, during the fire, or in an escaped fire situation analysis. In most cases this will be restricted to Fire Intensity Level (FIL) 1 or 2.
 - b) *Contain*: To surround a fire and any spot fires it produces with a control line which can reasonably be expected to check the fire's spread under prevailing and predicted conditions. It is restricted to FIL 1-2 and, in isolated cases, 3-4.
 - c) *Control*: To complete the control line around a fire and any interior islands to be saved, burn out any unburned areas adjacent to the fire side of the control line, and cool all hot spots that are immediate threats to the control line. The suppression strategy to be used will depend on the standards and guidelines for the given management area. The Control strategy may be used whenever the fire hazard is severe.

Fuels Treatment

1. Fuel treatment priorities will be:
 - Priority 1: Fuel treatment adjacent to communities where life and property are threatened by wildfire.
 - Priority 2: Fuel management support to functional and project planning.
 - Priority 3: The treatment of prior activity fuels.
 - Priority 4: The treatment of natural fuels where suppression capability alone cannot reasonably assure the cost-efficient attainment of resource management goals and objectives.
2. All slash-creating projects will be analyzed to determine whether slash must be treated.
3. A fuel treatment plan will be prepared for all projects which do not meet acceptable fuel levels.
4. Management activities will not be undertaken if slash cannot be reduced to an acceptable level.
5. Subject to meeting coarse woody debris requirements, the following fire hazard reduction applications should be considered:
 - a) *Utilization*: Harvest techniques such as top yarding, improved utilization methods identified in mill operation and log manufacturing studies, and residue treatment methods that optimize firewood use.
 - b) *Rearrangement*: Fuels may be redistributed on-site to a less hazardous condition or one which produces faster deterioration or removal.
 - c) *Removal*: Fuels may be moved off-site for use, storage, or disposal.
 - d) *Disposal*: The reduction or elimination of fuels by prescribed burning or manual, mechanical, chemical, or biological means.
 - e) *Conversion*: Replacing flammable vegetation with less flammable material.
 - f) *No reduction*. <FP IV-68]

Riparian Reserve Standards and Guidelines for Fire/Fuels Management [ROD C-35]

- FM-1 Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those

instances where fire suppression or fuels management activities could be damaging to long-term ecosystem function.

- FM-2 Locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve, an exemption may be granted following review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Use an interdisciplinary team to predetermine suitable incident base and helibase locations if in Riparian Reserves.
- FM-3 Minimize delivery of chemical retardant, foam, or additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or, following review and recommendation by a resource advisor, when an escape would cause more long-term damage.
- FM-4 Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.
- FM-5 Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by wildfire or a prescribed fire burning outside prescribed parameters.
- Other In Riparian Reserves, the goal of wildfire suppression is to limit the size of all fires. When watershed and/or landscape analysis, or province-level plans are completed and approved, some natural fires may be allowed to burn under prescribed conditions. Rapidly extinguishing smoldering coarse woody debris and duff should be considered to preserve these ecosystem elements. In Riparian Reserves, water drafting sites should be located and managed to minimize adverse effects on riparian habitat and water quality, as consistent with Aquatic Conservation Strategy objectives. <ROD C-36]

Pest Suppression and Prevention [FP IV-68]

To meet Forest objectives, Integrated Pest Management Prescriptions will be utilized to manage pests within the standards and guidelines for each Management Area. They may include manual, mechanical, cultural, biological, chemical, prescribed fire, and regulatory methods. Private landowners and other public agencies should be consulted and a cooperative effort made to control or minimize pest infestations when appropriate. <FP IV-68]

[FP IV-68a]

Noxious weeds and all unwanted vegetation will be treated by one or more of the following strategies, depending on the degree to which the infestation has progressed: prevention, early treatment, maintenance, correction, or deferred action. Prevention is the preferred treatment. Integrated Vegetation Management (IVM) methods available for use are: education, preventative measures, physical or mechanical methods, cultural methods (including prescribed fire), biological agents and herbicides.

If treatment is needed, it must be designed to lead toward a long-term prevention strategy. Economic, environmental, sociopolitical effects, and human health, especially with use of fire or herbicides, will be analyzed. <FP IV-68a]

Riparian Reserve Standards and Guidelines for Pest Management [FP IV-75>

Pests which adversely affect riparian vegetation should be suppressed or prevented using techniques which do not degrade water quality. Cultural and biological methods will be favored. <FP IV-75]

Range [FP IV-55>

Planning, Inventory and Permit Administration

1. A range inventory and analysis should be completed for each active allotment at least once every 10 years.
2. An allotment management plan should be developed for each active allotment.
3. Allotment periodical evaluation and monitoring should be conducted throughout the grazing season. The analysis should assess the condition of soils, water, stream channel condition, botanical areas, and wildlife habitats to determine if the Aquatic Conservation Strategy objectives are met. Also assessed should be native plant vigor and production, composition, and utilization. Protection may include such measures as range rotation and curtailment in critical areas; e.g., natural openings and riparian areas with the use of salting, fencing, and other methods.
4. Structural and nonstructural range improvements will be maintained in working condition by the parties designated in the term grazing permit.
5. When management activities remove natural barriers, fences will be constructed or extended as needed to maintain livestock control.
6. In watersheds which supply domestic water, livestock grazing may be permitted if an analysis of potential effects determines that degradation of that supply will not occur.
7. Conflicts between domestic livestock and big game deer and elk should be resolved in favor of big game deer and elk <FP IV-56] [FP IV-70>
8. Rehabilitation projects on areas degraded by livestock grazing and associated management activities should be done as soon as possible. <FP IV-70]

Riparian Reserve Standards and Guidelines for Grazing Management

[ROD C-33>

GM-1 Adjust grazing practices to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives. If adjusting practices is not effective, eliminate grazing.

Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside the Riparian Reserve, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.

GM-2 Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met. <ROD C-34]

1. Livestock grazing may be permitted if riparian values are protected. Of particular concern are: [FP IV-70>
 - a) Water quality
 - b) Stability of stream and lake banks
 - c) Soil compaction
 - d) Riparian vegetation
 - e) Fish and wildlife habitat
 - f) Sensitive plants
2. Bedding grounds will not be permitted in riparian areas.
3. Water developments (stock tanks), salting, fencing, driving enclosures, and seasonal use should be placed or timed to disperse grazing stock away from Riparian Reserves, Sensitive Botanical Areas, and Research Natural areas.

Recreation [FP IV-48>

Visual Quality Objectives (VQOs)

These standards and guidelines are designed to protect or enhance scenic and recreational values. Visual Quality Objectives should be considered for viewsheds seen from campgrounds, viewpoints, picnic areas, and other developed sites, as well as those seen from designated travel routes such as roads and rivers.

1. The Visual Quality Objectives assigned in each management area should be the minimum level acceptable and should be met by all activities. Standards and guidelines for Visual Quality Objectives are described below in Table 2-4 and Table 2-5.

2. Locations where rehabilitation may be required to meet established visual quality standards should be inventoried for accomplishment in all management areas permitting vegetative manipulation.
3. The Recreation Opportunity Spectrum (ROS) class assigned in each management area (except Wilderness) is the minimum level acceptable and should be met by all activities. See “Wilderness” Management Area for WROS direction in Chapter 3.
4. Opportunities to provide sites for wildlife viewing should be evaluated.
5. Geological and botanical features, waterfalls, cultural sites not eligible for the National Register, and similar items should be evaluated for their interpretive or recreational value. Where determined to be significant, these values should be protected. Actual boundaries and measures of protection will be determined in the Environmental Analysis for any project which may adversely affect the item. Refer to the standards and guidelines for caves and geologic features on page 2-33.
6. Trails are assigned one of three management levels and should be managed according to the standards and guidelines applicable to that level, unless other applicable standards and guidelines are more restrictive. Standards and guidelines for trail management begin on page 2-47. <FP 2-48]

Table 2-4 Visual Quality Objectives [FP IV-79>

	Foreground Retention	Middle ground Retention Foreground Partial Retention	Middle ground Partial Retention	Modification
Ground disturbance by any activity should be rehabilitated within one year to natural appearance.	X	X	—	—
Stumps resulting from any activity should, where they are visible (within 100 feet of the travelway), be flush-cut or otherwise concealed.	X	X (Foreground only)	—	—
A fully stocked timber harvest area will no longer be considered an opening when average tree height is in excess of:	20'	20'	20'	4 1/2'
Buildings should be located and designed to blend with the natural character of the land.	X	X	X	—
Harvest units may not dominate natural form, line, color, and texture.	X	X	X	—
Harvest units may dominate natural form, line, color, and texture, but must blend with the natural character of the land.	—	—	—	X
Retain diversity in undergrowth.	X	X (Retention only)	—	—
Maintain diversity of species and/or age classes.	X	X	—	—
Revegetation for visual quality and erosion control should be completed within one season after construction.	X	X	X	X
All quarry/stockpile sites should be located out of sight or rehabilitated.	X	X	X	—
Roads may not dominate the natural form, line, color, and texture.	X	X	X	—
All utility rights-of-way should be located and designed to blend with natural appearances.	X	X	X	—
Transmission towers will be screened or designed to blend with their surroundings.	X	X	X	—
Whenever it is practical, fire and fuel management activities will be designed to enhance visual quality.	X	X	X	—

Table 2-5 Timber harvest standards and guidelines required to meet visual quality objectives 1/

	Entry Cycle	2/ Target Tree Size	3/ Max. Harvest Per Entry Cycle	4/ Unit Size (visible)	3/ Max. Opening at Any Time (Percent)
Preservation	Ecological Change Only No Harvest				
Retention Foreground	10 year	36" DBH	6.6%	Roads: 1/2 - 3 acres within 500 ft. Trails: 1/4 - 1 acres within 500 ft. Both: 3 - 5 acres beyond 500 ft.	10
Retention Middle ground, Partial Retention Foreground	10 year	N/A 30" DBH	10%	Roads and Trails to: 5 acres within 500 ft. 5-10 acres beyond 500 ft.	14
Partial Retention Middle ground	10 year	N/A	12%	To 15 acres	20
Modification	As needed	N/A	No Restriction	Emulates natural features	N/A
1/ For additional criteria to be used in applying the Visual Management System, refer to Forest Service Handbook No. 559. These standards and guidelines are intended to apply where timber harvesting is done for the purpose of stand regeneration. If otherwise appropriate, unevenaged cutting methods may be a viable option in meeting the assigned Visual Quality Objective. 2/ May vary on less productive growing sites. 3/ Percentage of suitable timberland in the specific viewshed. 4/ Unit size means that portion of the unit visible from the designated viewing positions. Unit sizes may be increased where adequate vegetative screening exists. This does not change the assigned Visual Quality Objective. <FP IV-80]					

Recreation Opportunity Spectrum (ROS) [FP IV-75]

These standards and guidelines apply to all management areas except Wilderness. Wilderness is classified according to the Wilderness Recreation Opportunity System which is described in Chapter 3.

Primitive

Access

Primitive ROS is defined by an absence of roads. Recreational off-road vehicles will not be permitted. Power equipment and off-road vehicles (ORVs) may be permitted for trail construction and maintenance during periods of low visitation.

The creation of trails by visitors will be discouraged in trailless areas.

Trails should be constructed and maintained for the safety of visitors, to minimize or prevent resource damage, to distribute use, and when required by law, not for visitor convenience. They should be built to the Difficult or Most Difficult Standard and maintained at the minimum level. Local native materials should be used.

Facilities

Facilities should not be provided for the convenience of visitors. They should be limited to those required to protect resources. Camp units should not be designated in trailless areas; they may be designated in trailed areas, but not developed.

Visitor Contact, Direction, and Interpretation

The control of visitors is minimal. Visitor direction necessary to protect the ecological and social values of primitive areas will be provided by personal contact and information conveyed outside the area (at trailheads and administrative sites).

The area should be managed to limit encounters between visitors to one per day in trailless areas and six per day on trails. Combinations of persons and recreation livestock in excess of 12 should require written permission. Parties traveling cross-country should be no larger than six persons. No more than one designated camp unit should be visible from any other.

Recreation sites should be placed and recreation stock tethered away from the foreground view of lakeshores, streams, and key interest features, and at least 100 feet from main or through trails.

Open campfires may be limited to designated sites in trailed areas.

Semi-Primitive Non-Motorized*Access*

There will be no roads and off-road vehicles are not permitted. Existing primitive roads will be decommissioned and revegetated with native species.

Trail standards may range from Very Difficult to Least Difficult.

Some trails may be provided for the exclusive use of hikers.

Trails will be designed to disperse use and take advantage of scenic views and other points of interest whenever possible.

Trails will not be constructed or maintained to a standard higher than that designated.

Native, local, or natural-appearing materials will be used in trail construction and maintenance, including culverts and bridges.

Power equipment and ORVs may be permitted for trail construction and maintenance during periods of low visitation.

Facilities

Recreation facilities will be provided to protect resource values or distribute visitation rather than for the comfort of the users.

Visitor Contact, Direction, and Interpretation

Manage these areas so that no more than 15 trail encounters between visiting parties occur each day. Groups should not be larger than 20 persons.

The location of camps and management of recreation stock will be the same as in Primitive areas.

Natural barriers and obstacles may be used to direct visitation.

Visitor contact may occur through the news media, at administrative headquarters, and at entry points to Wildernesses and other destinations. There will be no on-site informational facilities.

Visitors will be primarily responsible for their own health and safety; there will be little regimentation.

Fire

Prescribed fire will be limited to areas where ground vegetation can recover in one year. Islands of unburned areas will be left and no more than 100 feet per mile will be burned adjacent to trails.

Semi-Primitive Motorized*Access*

Off-road vehicle use is usually limited to trails which are typically difficult and challenging.

Portions of the area or trails may be closed seasonally or year-round to prevent resource damage and conflicts between different users and to accomplish management goals for adjacent areas.

Trails will be designed to disperse use and take advantage of scenic views and other points of interest whenever possible. Existing primitive roads may be designated for ORV use.

Trails will be constructed and maintained to a standard no higher than that designated.

Native, local, or natural-appearing materials will be used in trail construction and maintenance, including culverts and bridges.

Facilities

Facilities are predominantly those required to distribute users.

Visitor Contact, Direction, and Interpretation

The area will be managed to produce no more than 15 encounters between visitors per day. Groups should be no larger than 25 persons. Larger groups may be accommodated by permit.

Campsites should be located away from lakeshores, streamsides, and trails. No more than three other campsites should be visible from a given site and ORVs will avoid lakeshore and streamside areas.

There will be no on-site informational facilities.

Fire

Prescribed fire is limited to areas where ground vegetation will recover in two years. Burned trailside frontage will be limited to 200 feet/mile.

Roaded Natural

Access

Access should:

1. Be provided to developed sites, trailheads, and other recreation areas.
2. Be managed to provide for low to moderate concentrations of recreation users.
3. Provide opportunities for dispersed motorized or non-motorized activities.
4. Emphasize scenic values associated with driving for pleasure.

Signs should be posted on all recreation roads and trail junctions, and at all trailheads. They will indicate route numbers, distances, and destinations.

Facilities

Facilities will be provided equally for protection of the site and comfort of users.

Parking facilities will be designed to accommodate the number of visitors appropriate to a given trail or recreation site.

Adequate and safe loading facilities for recreation livestock, boats, oversnow vehicles, and other ORVs may be provided.

Facilities should be designed to accommodate handicapped persons whenever practicable.

Camp units should be placed outside the foreground view from lakes, streams, trails, and key interest features.

Visitor Contact, Direction, and Interpretation

Simple wayside exhibits may provide information about features of the area. Information may also be conveyed via the news media and maps, brochures, and contacts at administrative headquarters and entry points.

Roaded Modified

Access

Access for a variety of vehicles, automobiles, and ORVs, and a broad range of travel experiences. Challenge/risk levels may be provided.

Skid trails or other low-standard roads may be used by motorcycles and other ORVs when this does not conflict with management objectives.

Road, trail, and area closures may be used to protect resource values, for safety, and to achieve recreational objectives.

Trails may be of any difficulty level.

Facilities

In general, no recreation facilities will be provided unless clearly needed for resource protection and user health and safety. Some pit or vault toilets and solid waste disposal units may be provided at frequently used sites.

Dispersed campsites are informal and will usually be chosen by the user.

Visitor Contact, Direction, and Interpretation

There will be few formal controls on visitor use. Maps and other recreational information will be available at administrative headquarters or other user contact points. On-site interpretative facilities will generally not be provided.

Other Activities

1. Informal campsites, hunter camps, or other areas where concentrated recreation use has occurred in the past should be retained whenever this is compatible with the resource objectives.
2. Roads and timber harvest areas should avoid crossing recreation trails whenever possible. <FP IV-78]

Trails [FP IV-82>

Trails are classified in one of three management levels depending on use levels and sensitivity. Standards and guidelines for each management level are described in Table 2-6. The following applies to all management levels:

1. Trail planning will determine the optimum long-term location for system trails. Planning should also minimize existing and future road crossings as well as other trail/road conflicts.
2. Trail relocation should occur only to move the trail to the optimum long-term location considering the recreation and other resource management objectives for the area.

3. When trails are interrupted by management activities, detours should be provided, or temporary trail closures declared and publicized. Detours of closures should be signed at trailheads and trail junctions. When a closure would remain in effect for longer than one season, a detour must be provided. When the activity is completed, trails should be reconstructed to prescribed locations and standards as soon as possible.
4. A road remains a trail crossing so long as it is generally recognizable as a road to the casual trail user.
5. For trail management purposes a created opening is defined as having an average tree height of less than 20 feet. This applies to Level III trails only when necessary to meet underlying management area standards and guidelines.
6. Protection of proposed trail locations will be addressed in the project environmental assessment on a case-by-case basis.
7. When a trail passes through a management area with more restrictive standards and guidelines, those more restrictive standards and guidelines will prevail.
8. When planning trail location or road decommissioning consider converting roads to trails. <FP IV-82]

Table 2-6 Trail Management standards and guidelines Forest Trail System-Management Levels
[FP IV-81]>

Trail Mgmt Level	VQO		Corridor Width	Road Crossing	Timber Mgmt.
	Fore-ground	Middle ground			
I	R	M	Foreground up to 500 feet each side depending on topography	No new roads, close existing local roads.	No scheduled timber harvest. Harvest permitted to meet recreation objectives.
II	PR	M	Foreground up to 500 feet each side depending on topography	1. For Wilderness or semi-primitive area access trails; new road crossings within 1/2 mile of the boundary or between the nearest trailhead and the boundary, whichever distance is shortest. 2. No new road crossings within 2 miles of existing road crossings.	Created openings not to exceed 500 feet per each lineal mile per decade, either one or both sides of trail. Timber harvest may be scheduled.
III	Same as the management area		N/A	Permanent road crossings should be minimized. Temporary roads should be obliterated after the activity is completed.	Same as the management area <FP IV-81]

Recreation Facility Management [FP IV-48]>

1. Recreation facilities, including buildings, campsites, roads, utility systems, and signing should be planned, developed, maintained, and operated for safe public use, to current standards, in a cost-effective manner. Construction or reconstruction of facilities will comply with the approved site development plan.

2. No new sites for recreation residences will be developed on National Forest land.
3. Facilities will be designed to accommodate the disabled wherever practicable.
4. Industrial operations should not infringe upon public use of established recreation sites or the roads which access the sites. Infringements include such things as competing for campsites or piling culverts or other materials on sites or along roads. This direction is not intended to preclude any needed contract work. <FP IV-48]

Manage Recreation Areas to Minimize Disturbance to Species

[ROD C-6>

This standard and guideline applies throughout all land allocations. This standard and guideline will benefit a number of fungi and lichen species whose known locations are predominantly within established recreation sites. This standard and guideline falls within the category of the survey and manage standard and guideline on page 2-63, and species to be protected through this standard and guideline are among those shown in Table 2-10. Species known to exist in recreation areas and additional information on the habitat requirements of these species are discussed in Appendix J of the Final SEIS. <ROD C-6]

Recreational Use Administration [FP IV-48]

1. Unless otherwise noted, off-road vehicle (ORV) direction found in the management areas does not apply to oversnow machines. Snow machines are generally excluded from such areas as Wilderness, Wild Rivers, RNAs, the Experimental Forest, and areas to which the Semi-Primitive Non-Motorized ROS class is assigned. They are generally acceptable elsewhere on the Forest where adequate snow protects soil and vegetative resources. Designated areas such as cross-country ski areas may be closed to snowmobiles.
2. "The Forest Travel Plan" will provide information on where travel, including the use of ORVs, is permitted or limited. The Travel Plan should be reviewed annually and revised, if necessary, to meet Forest Plan objectives.
3. During the first ten years of plan implementation, no mile of trail open to motorized use can be closed to such use unless a replacement mile is made available elsewhere on the Forest. <FP-IV-49]

Wild and Scenic Rivers [FP IV-19>

The following four river segments are recommended to Congress for designation as part of the National Wild and Scenic River System (see Table 2-7). Until Congress has taken action, values which make them eligible and suitable for Wild and Scenic Rivers designation will be protected on National Forest lands (except for approximately one mile of the Cispus River crossing private land).

Table 2-7 Rivers recommended for designation.

Stream	Classification	Miles Within N.F.	Total Miles
Lewis River	Wild	4.0	4.0
	Scenic	20.0	29.0
	Recreational	0.0	1.5
Cispus River	Wild	6.8	6.8
	Scenic	39.7	*45.2
Muddy Fork Cowlitz River	Wild	5.0	10.0
	Scenic	1.0	1.5
Clear Fork Cowlitz River	Wild	5.0	5.0
	Scenic	10.0	10.0
TOTAL		100.5	113.0
* Does not include approximately 1½ miles within the project boundary of the Cowlitz Falls Hydroelectric Project (FERC Project No. 2833), as licensed by the Federal Energy Regulatory Commission. <FP IV-19a>			

Additional river segments will require further study in order to determine suitability (see Table 2-8). This will require a separate environmental analysis, including documentation, for each river, and coordination with state and local governments and adjacent private landowners. Until these analyses are completed, the values contributing to their particular classification will be protected on National Forest lands.

Table 2-8 Eligible rivers for further study. [FP IV-20]

Stream	Classification	Miles Within N.F.
Clear Creek	Wild	6.3
	Scenic	4.2
Green River	Wild	6.1
	Scenic	4.0
Ohanapecosh River	Scenic	3.0
Quartz Creek	Wild	7.7
	Scenic	1.8
Siouxon Creek	Wild	11.3
Smith/Muddy	Wild	13.4
	Scenic	12.5
Toutle River	Wild	11.3
White Salmon	Wild	7.4
	Scenic	13.3
Yellowjacket Creek	Wild	7.0
	Scenic	1.3
Cowlitz River	Recreational	1.0
East Fork Lewis River	Scenic	10.9
	Recreational	0.0
Wind River	Scenic	9.5
TOTAL		132.0

<FP IV-20]

Riparian Reserves Standards and Guidelines for Recreation [FP IV-70]

1. The Visual Quality Objectives and Recreation Opportunity Spectrum classes will be those of the Management Area in which the Riparian Reserve is found.
2. Neither newly developed recreation sites nor expansions to existing sites will be located on the riparian influence area of perennial and intermittent streams or flood plains. Developed and dispersed recreation sites should be located at least 100 feet from the edges of lakes, streams, ponds, wet meadows, marshes, and springs. Existing sites will be made to comply with Executive Orders 11988 and 11990. Water oriented facilities may be developed providing the riparian values can be protected.
3. Trails should not be located within the riparian influence area (up to 300 feet) of lakes, ponds, marshes, wet meadows, moist meadows, wet shrubs lands, and forb lands.
4. Dispersed recreational activities which degrade the quality of riparian areas should be regulated or eliminated, e.g., the trampling of streambanks and lakeshores.

Facility and Site Reconstruction and Construction

Facilities will be designed to minimize adverse impacts on all Riparian Areas and to protect investments.

Facility and Site Management and Use Administration

1. Whenever damage occurs due to recreational activities, streambanks and other riparian areas should be promptly restored by revegetation and stabilization.
2. Off-road vehicles will be limited to designated trails and stream crossings. Oversnow machine use may be permitted if snow is of sufficient depth to protect riparian values. <FP IV-70]

[ROD C-34]

- RM-1 New recreational facilities within Riparian Reserves, including trails and dispersed sites, should be designed to not prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impact to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives. Where this standard cannot be met, require relocation or closure of recreation facilities.
- RM-2 Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.
- RM-3 Wild and Scenic Rivers and Wilderness management plans will address attainment of Aquatic Conservation Strategy objectives. <ROD C-34]

Research

A variety of wildlife and other research activities may be ongoing and proposed in all land allocations. These activities must be assessed to determine if they are consistent with the objectives of these standards and guidelines. Some activities (including those within experimental forests) not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of these standards and guidelines, will produce results important for habitat development, or if the activities represent continuation of long-term research. Every effort should be made to locate non-conforming activities in land allocations where they will have the least adverse effect upon the objectives of these standards and guidelines. <ROD C-4> [FP IV-58]

Representatives from the Forest and Pacific Northwest Research Station (PNW) will meet annually to coordinate research activities on the Forest. On lands outside the Experimental Forest and RNAs, coordination should include:

1. The location of existing and proposed research sites. All sites should be located on maps and photos and installed in the Districts' GIS system. Research in Wildernesses requires Regional Forester approval.
2. Opportunities to consolidate research sites.
3. The termination of sites no longer required for research.
4. The Subunit Manager should notify PNW of any proposed activities adjacent to the Experimental Forest, RNAs, or any research study plot.
5. The accomplishment of specific research needs identified by the Forest Supervisor.

Timber harvesting within 250 feet of the Thornton T. Munger Research Natural Area should occur only when trees in adjacent harvest areas have reached a height that will prevent serious windthrow in the RNA. <FP IV-59>

Riparian Reserves Standards and Guidelines for Research [ROD C-38]

- RS-1 A variety of research activities may be ongoing and proposed in Key Watersheds and Riparian Reserves. These activities must be analyzed to ensure that significant risk to the watershed values does not exist. If significant risk is present and cannot be mitigated, study sites must be relocated. Some activities not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of this plan; will produce results important for establishing or accelerating vegetation and structural characteristics for maintaining or restoring aquatic and riparian ecosystems; or the activities represent continuation of long-term research. These activities should be considered only if there are no equivalent opportunities outside of Key Watersheds and Riparian Reserves.

RS-2 Current, funded, agency-approved research, which meets the above criteria of RS-1, is assumed to continue if analysis ensures that a significant risk to Aquatic Conservation Strategy objectives does not exist. The Regional Ecosystem Office may choose to more formally review specific projects, and may require modification, up to and including cancellation, of those projects having an unacceptable risk to Key Watersheds and Riparian Reserves. Risk will be considered within the context of the Aquatic Conservation Strategy objectives. <ROD C-38]

Rural Community and Human Resources [FP IV-64]

1. Meaningful job opportunities should be provided for senior citizens.
2. Volunteers should be recruited and utilized in maintenance, construction, and administration activities. Opportunities to engage volunteers in activities such as wildlife inventories, trail work, and other recreational projects will be sought.
3. Job opportunities will be made available to minorities, women, and the handicapped in accordance with the Forest's Affirmative Action Program for Civil Rights. <FP IV-64]

Timber [FP IV-56]

Timber removal may be necessary in the event of catastrophic fires, volcanic eruption, windthrow, disease or insect infestation. If such removal is needed in management areas which do not call for scheduled timber harvest, it must be authorized by the Forest Supervisor. Such decisions should include consultation with appropriate federal and state agencies to minimize adverse impacts on fish and wildlife values.

Future timber inventories will include riparian areas. <FP IV-56]

[FP IV-58]

Tree removal in management areas with no scheduled timber harvest will be limited to that specified in individual management area standards and guidelines (except in the case of catastrophic events).

Tree removal in management areas with no scheduled timber harvest will be limited to that specified in individual management prescriptions (except in the case of catastrophic events). <FP IV-58]

[FP IV-56]

Future timber inventories will include riparian areas. <FP IV-56]

Ecosystem Description and Inventories [FP IV-56]

The Forest's "Plant Association and Management Guide(s)" should be consulted prior to management activities that may alter vegetative types. <FP IV-56]

Vegetative Management [FP IV-34a]

The Forest Plan incorporates the Pacific Northwest Region's FEIS for Managing Competing and Unwanted Vegetation (1986). In addition upon implementing the Forest Plan through project activities, the Forest will comply with the Record of Decision issued by the Regional Forester dated December 8, 1988, and the Mediated Agreement of May 1989. Use of vegetation treatment methods (biological, mechanical, prescribed burning, or herbicides) is allowed only when other methods (i.e., prevention) are ineffective or will unreasonably increase project costs. Emphasis must be on prevention and early treatment of unwanted vegetation and full public involvement in all aspects of project planning and implementation. Information about the vegetation management FEIS, ROD, and Mediated Agreement are available at the Forest Supervisor's Office. <FP IV-34]

[FP IV-34a]

Noxious weed management is in cooperation with the Washington Department of Agriculture as documented in the Memorandum of Understanding signed by the Regional Office, for the Gifford Pinchot National Forest, in February 1991. The Forest also cooperates with the Weed Control Extension Agents of Lewis, Skamania, Klickitat, and Pierce counties, and with farmers, ranchers, and neighboring landowners on the management of noxious weeds.

There are 37 noxious weeds listed by the State which could or do occur on the Forest. These are listed below according to priority of treatment. Class A weeds pose the most serious threat and the management goal is to eradicate the species and prevent all seed production. Class B are also serious threats, but more widespread and the goal is containment and eventual eradication (Class B weeds, which comprise the majority, are further broken down into sub-categories of higher and lower priorities). Class C weeds are any other noxious weeds and the level of control is at the counties' discretion.

In addition to the State lists, management responsibility includes problem weeds of Federal designation.

Two separate but related documents, the *Final Environmental Impact Statement for Managing Competing and Unwanted Vegetation* (1986) and the *Mediated Agreement on Vegetation Management* (1989), provide further detailed management requirements.

Table 2-9 Noxious weeds listed by the State of Washington <FP IV-34a>

Class A	Class B (Higher Priority)	Class C (Lower Priority)
giant hogweed knapweed, vochin Scotch broom oxeye daisy perennial pepperweed tansy ragwort knapweed, diffuse knapweed, meadow knapweed, spotted oxtongue hawkweed yellow starthistle	knapweed, meadow knapweed, diffuse knapweed, spotted tansy ragwort dalmation toadflax purple loosestrife gorse	blueweed bryony, white bugloss, common camelthorn* catsear, spotted* cordgrass, smooth deadnettle, hybrid foxtail, slender goatgrass, jointed* hawkweed, orange* hawkweed, yellow knapweed, black knapweed, brown knapweed, Russian nutsedge, yellow oxtongue hawkweed* pepperweed, perennial* sandbur, longspine* Scotchbroom* skeletonweed, rush sowthistle, perennial* spurge, leafy starthistle, yellow swainsonpea* thistle, musk thistle, plumeless thistle, Scotch watermilfoil, Eurasian *designated in a portion of the Forest

Riparian Reserves Standards and Guidelines for Timber [ROD C-31>

TM-1. Prohibit timber harvest, including fuelwood cutting, in Riparian Reserves, except as described below. Riparian Reserve acres shall not be included in calculations of the timber base.

- a) Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.
- b) Remove salvage trees only when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.
- c) Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

<ROD C-32]

[FP IV-73>

1. Riparian wetlands, which are in close proximity and function, both hydrologically and biologically in an interconnected manner, may be managed as a single riparian complex.
2. There should be no disturbance of lakes, pond, marshes, shrublands, or forblands. Logging and other equipment should not be operated within these natural openings. Trees should be felled away from them.
3. Herbicides and other pesticides will not be applied in Riparian Reserves.

Nursery Management

Water quality standards and protection of the fishery and other riparian values should be met in Nursery operations. <FP IV-73]

Water, Soil, and Air [FP IV-59]

Planning and Inventory

All management activities will meet Forest Service Region 6 Streamside Management Goals, FSM 2520, R6 Supplement 2500-90-1, 8/1/90, to protect or enhance water quality, fish, riparian vegetation, and other aquatic resources.

1. Air quality will comply with the Washington State Smoke Implementation Plan. Class I Airshed standards will be met as required by the Clean Air Act of 1977. The Act defines a Class I Airshed as:
 - a) An international park.
 - b) Wildernesses and national memorial parks exceeding 5,000 acres in size.
 - c) National parks which exceed 5,000 acres in size, all of which were in existence when the Clean Air Act Amendments of 1977 were enacted.

Currently, Mount Rainier National Park and the Mount Adams and Goat Rocks Wildernesses are the only Class I Airsheds within or adjacent to the Forest.

2. To realize clean air objectives, the following measures may be taken:
 - a) Prohibit burning on visibility sensitive days (holidays) and on weekends from July 1 to Labor Day.
 - b) Burning will be monitored to ensure that smoke intrusion in the designated Class I areas does not occur on visibility sensitive days.
 - c) Better utilization methods may be explored and used to reduce emissions.
 - d) Select site treatment practices to minimize soil and litter disturbance. To avoid burning on sensitive days, slash may be piled when possible.
 - e) The spread, location, and size of prescribed fires in Wildernesses and adjacent management areas will be monitored to determine visibility impacts on Class I areas. When it is determined that impairment of air quality from such fires is or may become major, the fire may be classified as a wildfire and appropriate suppression measures taken.
 - f) Refinement of burning techniques to reduce the smoldering of prescribed burns should continue, subject to meeting coarse wood debris standards and guidelines (see page 6-1). For example, this can be accomplished through PUM (piling unutilized material), use of mass ignition systems, burning with increased fuel moisture in the large fuels, or use of logging systems and techniques that allow an increased use of large residue (slash) for firewood removal and other wood products (chips, etc.).
3. Proposals by other agencies and the private sector which have a potential to degrade the quality of air over National Forest lands will be analyzed. A report of the findings will be provided to the Washington State Department of Ecology.

4. The Watershed Improvement Needs Inventory, an ongoing list of projects needed to protect or enhance watershed values, should be updated annually (priorities and costs included) and supported by watershed analysis.
5. The Washington State Shoreline Management Act will be consulted whenever activities on National Forest lands may affect adjacent or downstream landowners.
6. “Soil Management Guidelines, Gifford Pinchot National Forest” (Dec. 17, 1977), as amended, will apply unless on-the-ground assessment indicates a change in the guidelines is necessary.
7. Geologic conditions will be considered in the location and design of roads and other construction projects; unstable areas identified in the Forest’s “Geologic Resources and Condition Maps” will be avoided unless a thorough economic analysis justifies an exception or unless on-the-ground investigation indicates a change in the assessment is necessary. Apparent conflicts which may arise between these Geologic Conditions and the “Soil Management Guidelines” (above) will be resolved by the Forest Geologist and Soil Scientist. <FP IV-60]

Water and Soil

Best Management Practices [FP IV-60]

State requirements shall be complied with in accordance with the Clean Water Act for protection of waters of the State of Washington (Washington Administrative Code [Chapter 173-201 and 202], Department of Ecology, which contains water requirements for protection of various classes of surface waters) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act, regulations, and Federal guidance issued thereto.

In cooperation with the State of Washington, the Forest shall use the following process:

- a) Select and design BMPs based on site-specific conditions, technical, economic, and institutional feasibility, and the water quality standards for those waters potentially impacted.
- b) Implement and enforce BMPs.
- c) Monitor to ensure that practices are correctly applied as designed.
- d) Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards.
- e) Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected.
- f) Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water

quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.

The process agreed to in the following Memorandum of Understanding (MOU) shall be used to implement the State Water Quality Management Plan on lands administered by the USDA Forest Service:

The Washington Department of Ecology and U.S. Department of Agriculture, Forest Service (7/79), and “Attachment A” referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest Lands in the Pacific Northwest) 12/78).

General Best Management Practices are described in “General Water Quality Best Management Practices,” Pacific Northwest Region, November, 1988. This provides guidance but is not a direction document. Also included in this document is a description of the process and limitations and use of these BMPs. Each BMP listed includes the title, “Objectives, Explanation, Implementation and Responsibility, and Monitoring.” Evaluations of ability to implement and estimated effectiveness are made at the project level.

Not all of the general BMPs listed will normally apply to a given project, and there may be specific BMPs which are not represented by a general BMP in this document.

The sensitivity and significance of the project determines whether the site-specific BMP prescriptions are documented in an EA, EIS, sale plan, project plan, or in analysis files.

Best Management Practices relating to protection of water quality shall be followed for any chemical application projects. In the event of an accidental spill of hazardous materials, procedures shall be followed as set forth in the Oil and Hazardous Substances Pollution Contingency Plan (FSM 7443).

Inventories

Inventories of water quality and quantity information collected by State and other Federal agencies should be obtained for project planning, design, and implementation.

Minimum in-stream flow requirements will be established for all hydroelectric projects in cooperation with the appropriate State agencies. <FP IV-61]

Ongoing watershed condition inventories should be conducted to provide a current information base for use in planning activities. <FP IV-74]

Cumulative Impact

In watersheds or other areas where project scoping or watershed analysis identifies an issue or concern regarding the cumulative effects of activities on water quality, stream channels, wildlife, soils, vegetation, other resources, or on secondary effects such as social and economic impacts, a cumulative effects assessment will

be made. This will include land in all ownerships in the area. Activities on National Forest System lands in these areas should be dispersed in time and space to the extent practicable and, at least to the extent necessary to meet Management Requirements (MRs) on intermingled ownerships, scheduling of activities should be coordinated.

Administration/Management

1. When streamflow is temporarily diverted to accommodate construction or other activities, it will be restored to the natural course as soon as is practical.
2. A Ranger District liaison officer will be designated to provide coordination on all hydroelectric projects.
3. Activities involving sources of domestic and municipal water, especially those in which pesticides and fertilizer are used, will be given monitoring priority.
4. Significant capital investment projects will not be cited within Federal Energy Regulatory Commission (FERC) power withdrawals unless it would be practical to relocate them if the hydroelectric site is developed. (Applications for permit and license automatically establish a withdrawal on the described lands; lands included in an application for exemption, however, are not withdrawn.)
5. No more than a total of 20 percent of an activity area may be compacted, puddled, displaced, or subjected to a severe burn as a result of the activity. This standard is further qualified as follows:
 - a) Prescribed burning activities must result in less than 10 percent of the activity area burned rated as a severe intensity.
 - b) Any mass failures are to be included in the displaced soil category.
 - c) An activity area is the total area for which a ground-impacting activity is planned. It may be the units of a timber sale, a slash disposal project, site preparation project, or grazing allotment, and includes the transportation system (including landings) in and directly adjacent to the activity area.
6. The Bear Creek Watershed will continue to be the major source of municipal water for residents in the area of Carson, Washington, and will be managed under terms of the "Management Policy Statement for Bear Creek Watershed." This agreement with the Public Utility District of Skamania County was signed by the Forest Supervisor May 1, 1967.
- 7a. Protect established snow courses and related hydrometeorological data sites including a 400-foot buffer zone in all directions from the sampling points, or a mutually-agreed-upon buffer zone as specified on data site sketch maps, from any disturbing influence such as road building, timber harvest, or vegetative disturbance which will affect snow accumulation or measurement. Snow courses and related data sites will be noted in Ranger District GIS or other data management systems to remind Forest managers of the need to protect these sites.

- 7b. Make no change in management or use of a data site which would impair its value for data collection unless there is no other alternative; in such a case, Regional Forester approval of the change will be made only after the State Conservationist has been notified in writing. Such notice should be given sufficiently far in advance that an alternative data site can be selected and a correlation between the two established. A five-year minimum is desirable. Compatible uses of the site will be continued.

Rights/Use Management

1. The Water Rights-Use-Needs Inventory should be kept current.
2. A State water right will be required for each use of water, with the exception of activities covered by the Reservation Principle (on this Forest, Watershed Protection and Timber Management). <FP IV-62]

Riparian Reserve Standards and Guidelines for Management and Restoration [ROD C-37]

- RA-1 Identify and attempt to secure in-stream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.
- RA-2 Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet coarse woody debris objectives.
- RA-3 Herbicides, insecticides, and other toxicants, and other chemicals shall be applied only in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.
- RA-4 Locate water drafting sites to minimize adverse effects on stream channel stability, sedimentation, and in-stream flows needed to maintain riparian resources, channel conditions, and fish habitat.

Watershed and Habitat Restoration

- WR-1 Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the integrity of native species, and attains Aquatic Conservation Strategy objectives.
- WR-2 Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.
- WR-3 Do not use mitigation or planned restoration as a substitute for preventing habitat degradation. <ROD C-37]

Wildlife, Fish, Plants, and Fungi

Planning and Administration [FP IV-50]

The wildlife management standards and guidelines in this section address the following areas: Sensitive, Threatened, and Endangered species; snags, reserve trees, and down logs; cooperation with other agencies; and special habitat not covered elsewhere in the Forest Plan. Any project which could affect wildlife or fishery habitats will be reviewed. Review will consist of at least an inventory of fish and wildlife habitat and associated significant species, and will identify limited and important habitats and/or species. <FP-IV-50]

Survey and Manage [ROD C-4]

These measures may apply within any land allocations. The survey and manage provision for each species, however, will be directed to the range of that species and the particular habitats that it is known to occupy. The “survey and manage” standard and guideline will provide benefits to amphibians, mammals, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropods.

Table 2-10, “Species Documented or Suspected to Occur on the Gifford Pinchot National Forest,” on page 2-66, shows what species are covered by the survey and manage provision, and which of the following four categories is to be applied to each. Table 2-10 is a subset of species from the updated ROD Table C-3 which are known or suspected to occur on the Gifford Pinchot National Forest. This list was prepared as a guide to aid in screening the localized species that have little likelihood of occurring on the Forest. The complete list should be consulted during planning and Table 2-10 amended as new information becomes available.

The standard and guideline contains four components, and priorities differ among them.

1. *Manage known sites.* Management of known species sites should receive the highest priority of these four categories. Efforts must be undertaken to acquire information on these known sites and to manage this information so that it is available to all project planners. An effective way to accomplish this is to compile the information in a GIS data base. Those efforts should be coordinated by the Regional Ecosystem Office, and should be completed expeditiously. As soon as the information becomes available, it should be used in the design or modification of activities. Activities that are implemented in 1994 should use this information to the greatest degree possible. Activities implemented in 1995 and later must include provisions for these known sites. In most cases, the appropriate action will be protection of relatively small sites, on the order of tens of acres. For some species, including some vascular plants, the appropriate action will include the use of specific management treatments such as prescribed fire. For rare and endemic fungus species, areas of 160 acres should be temporarily withdrawn from ground-disturbing activities around known sites until those sites can be thoroughly surveyed and site-specific measures prescribed. For one fungus species, *Oxyporous nobilissimus*, there are only six known sites and two of these do not currently have a protected status. Management areas of all useable habitat up to 600 acres are to be established around these two sites for the protection of those populations until

the sites can be thoroughly surveyed and site-specific measures prescribed. The actions to protect *Oxyporous* must be undertaken immediately.

2. *Survey prior to ground-disturbing activities.* Measures to survey for species and manage newly discovered sites are to be phased-in over a somewhat longer time frame than the measures specified for currently known sites (see above). For some species, these efforts have been ongoing through rare and sensitive species programs. Where such efforts have been ongoing, they should continue. Protocols, however, have not been developed for surveys for all of these species and the expertise needed to conduct them is not readily available in some cases. Efforts to design protocols and implement surveys should be started immediately. Where surveys are completed, the information gathered from them should be used to establish managed sites for species.

Surveys must precede the design of all ground-disturbing activities (that will be implemented in 1997 or later) within the known or suspected ranges of (and within the habitat types or vegetation communities associated with) the following species:

- Larch Mountain salamander
- Van Dyke's salamander

Surveys for lynx are also required, see Chapter 6, "Protection Buffers," page 6-7.

Development of survey protocols by the REO for the other species listed in Table 2-10, must begin in 1994 and proceed as soon as possible. Additional information concerning the biology and management implications for these species is contained in FSEIS Appendix J2. These surveys must be completed prior to ground disturbing activities that will be implemented in F.Y. 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the SEIS. Management standards will be developed to manage habitat for the species on sites where they are located. These surveys may be conducted at a scale most appropriate to the species. For most species, this survey would start at the watershed analysis level with identification of likely species locations based on habitat. Those likely locations would then be thoroughly searched prior to implementation of activities. For other species, the identification of likely sites may be most appropriately done at the scale of individual projects. Surveys should be designed for maximum efficiency, focusing on the likely range and habitats of the target species. Multispecies surveys should be used wherever they would be most efficient. To the degree possible, surveys should be designed to minimize the number of site visits needed to acquire credible information. Survey protocols and proposed site management should be incorporated into interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.

3. *Extensive surveys.* Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement. Rather, the surveys will be done according to a schedule

that is most efficient, and sites will be identified for protection at that time. This strategy entails some risk because some species sites may be disturbed prior to completion of surveys. It is recommended primarily for species whose characteristics make site and time-specific surveys difficult. For example, some fungi only produce fruiting bodies under specific climatic conditions, so finding their location may take several to many years. It would be most efficient to do broad surveys for these species during times of appropriate conditions rather than attempting annual, site-specific surveys. Surveys under this strategy must be underway by 1996. As with surveys described in item 2 above, surveys should be designed for efficiency and standardized protocols should be developed.

4. *General regional surveys.* The objective is to survey for the species to acquire additional information and to determine necessary levels of protection. Species intended to benefit from this standard and guideline are the arthropods, the fungi species that were not classed as rare and endemic, bryophytes, and lichens. These groups of species are particularly poorly known. Many species have likely not yet been identified, and there is only general information available on the abundance and distribution of known species. The information gathered through these efforts may be useful in refining these standards and guidelines to better provide for these species as part of the adaptive management process. These surveys are expected to be both extensive and expensive, but the information from them is critical to successful implementation of ecosystem management. They will be initiated no later than F.Y. 1996 and are to be completed within ten years.
5. *Annual status reports are to be submitted to the Regional Ecosystem Office for review beginning at the end of F.Y. 1995.* As experience is acquired with these requirements, agencies may propose changes to the Regional Ecosystem Office for analysis. These changes could include changing the schedule, moving a species from one survey strategy to another, or dropping this mitigation requirement for any species whose status is determined to be more secure than originally projected. The Regional Ecosystem Office will forward such proposals, along with recommendations, to the Regional Interagency Executive Committee for action as appropriate. <ROD C-6j

Table 2-10 Species Documented or Suspected to Occur on the Gifford Pinchot National Forest from Table C3 of the ROD. [ROD C-49>

Status: D - Documented to Occur on the Gifford Pinchot National Forest
S - Suspected to Occur on the Gifford Pinchot National Forest
Blank - Status is unknown

Protection Buffer		Status	1	2	3	4	Species	Common Name/Subgroup	Group
LSR	MLSR								
		D	√	√			<i>plethodon vandykei</i>	Van Dyke's salamander (riparian)	amphibians
	√	D		√			<i>plethodon larselli</i>	Larch Mountain salamander(terrestrial)	amphibians
		D				√		understory and forest gap herbivores	arthropods
		D	√	√			<i>lasionycteris noctivagans</i>	silver-haired bat	bats
		D	√	√			<i>myotis evotis</i>	long-eared myotis	bats
		D	√	√			<i>myotis thysanodes</i>	fringed myotis	bats
		D	√	√			<i>myotis volans</i>	long-legged myotis	bats
		D	√	√			<i>strix nebulosa</i>	great grey owl	birds
√		D					<i>ulota meglospora</i>	moss	bryophytes
	√	D					<i>buxbaumia viridis</i>	moss	bryophytes
	√	D					<i>rhizomnium nudum</i>	moss	bryophytes
	√	D	√		√		<i>tetraphis geniculata</i>	moss	bryophytes
		D				√	<i>antitrichia curtispindula</i>	moss	bryophytes
	√	S	√		√		<i>brotherella roelli</i>	moss	bryophytes
	√	D					<i>buxbaumia piperi</i>	moss	bryophytes
		S	√	√			<i>diplophyllum plicatum</i>	liverwort	bryophytes
		S	√		√		<i>diplophyllum albicans</i>		bryophytes
		D				√	<i>douinia ovata</i>	liverwort	bryophytes
		S	√	√			<i>kurzia makinoana</i>	liverwort	bryophytes
		S	√		√		<i>racomitrium aquaticum</i>	moss	bryophytes
	√	S	√		√		<i>schistostega pennata</i>	moss	bryophytes
		S				√	<i>scouleria marginata</i>	moss	bryophytes
		S	√	√			<i>tritomaria exsectiformis</i>	liverwort	bryophytes
		S	√		√		<i>albatrellus avellaneus</i>	uncommon ecto-polypore	fungi
		D			√		<i>albatrellus ellisii</i>	uncommon ecto-polypore	fungi
		D			√		<i>albatrellus flettii</i>	uncommon ecto-polypore	fungi
√		D					<i>aleuria rhenana</i>	rare cup fungi/stalked orange peel fungus	fungi
		S	√		√		<i>aleurodiscus farlowii</i>	rare resupinates/ polypores	fungi
		S	√		√		<i>alpava alexsmithii</i>	rare false truffle	fungi
		D			√		<i>asterophora lycoperdoides</i>	parasitic fungi	fungi
		S			√		<i>asterophora parasitica</i>	parasitic fungi	fungi
		S			√		<i>baeospora myriadophylla</i>	uncommon gilled mushroom	fungi
		S	√		√		<i>balsamia nigra</i>	rare truffle	fungi
		S	√		√		<i>boletus haematinus</i>	rare bolete	fungi
		D			√		<i>boletus piperatus</i>	low elevation bolete	fungi
		S	√		√		<i>boletus pulcherrimus</i>	rare bolete	fungi
		D	√	√	√		<i>bondarzewia montana (mezentarica)</i>	bondarzewia polypore	fungi
		S	√		√		<i>bryoglossum gracile</i>	rare cup fungi	fungi
		D			√	√	<i>cantharellus cibarius</i>	chanterelles	fungi
		D	√		√		<i>cantharellus formosus</i>	rare chanterelle	fungi
		D			√	√	<i>cantharellus subalbidus</i>	chanterelles	fungi
		D			√	√	<i>cantharellus tubaeformis</i>	chanterelles	fungi
		D			√		<i>catathelasma ventricosa</i>	uncommon gilled mushroom	fungi
		S	√		√		<i>Chamonixia pacifica</i> sp. nov.	undescribed taxa, rare	fungi

				Trappe 12768	truffles/false truffles		
	S	√	√	<i>choiromyces alveolatus</i>	rare truffle	fungi	
	S	√	√	<i>choiromyces venosus</i>	rare truffle	fungi	
	S		√	<i>chrysomphalina grossula</i>	uncommon gilled mushroom	fungi	
	S		√	√	<i>clavariadelphus borealis</i>	club coral fungi	fungi
	D		√	√	<i>clavariadelphus ligula</i>	club coral fungi	fungi
	S		√	√	<i>clavariadelphus lovejoyae</i>	club coral fungi	fungi
	D		√	√	<i>clavariadelphus pistilaris</i>	club coral fungi	fungi
	S		√	√	<i>clavariadelphus sachalinensis</i>	club coral fungi	fungi
	S		√	√	<i>clavariadelphus subfastigiatus</i>	club coral fungi	fungi
	D		√	√	<i>clavariadelphus truncatus</i>	club coral fungi	fungi
	S		√		<i>clavicornia avellanea</i>	coral fungi	fungi
	D		√	√	<i>clavulina cinerea</i>	branched coral fungi	fungi
	D		√	√	<i>clavulina cristata</i>	branched coral fungi	fungi
	S		√	√	<i>clavulina ornaticipes</i>	branched coral fungi	fungi
	S	√	√		<i>clitocybe senilis</i>	rare gilled mushroom	fungi
	S	√	√		<i>clitocybe subditopoda</i>	rare gilled mushroom	fungi
	S	√	√		<i>collybia bakerensis</i>	uncommon gilled mushroom	fungi
	S		√		<i>collybia racemosa</i>	parasitic fungi	fungi
	D		√		<i>cordyceps capitata</i>	parasitic fungi	fungi
	S		√		<i>cordyceps ophioglossoides</i>	parasitic fungi	fungi
	S		√		<i>cortinarius azureus</i>	uncommon gilled mushrooms	fungi
	S	√	√		<i>cortinarius wiebeae</i>	uncommon gilled mushrooms	fungi
	S	√	√		<i>cortinarius boulderensis</i>	uncommon gilled mushrooms	fungi
	S	√	√		<i>cortinarius canabarpa</i>	rare gilled mushrooms	fungi
	S		√		<i>cortinarius cyanites</i>	uncommon gilled mushrooms	fungi
	S	√	√		<i>cortinarius magnivelatus</i>	uncommon gilled mushrooms	fungi
	D	√	√		<i>cortinarius olympianus</i>	uncommon gilled mushrooms	fungi
	S				<i>cortinarius rainierensis</i>	uncommon gilled mushrooms	fungi
	S		√		<i>cortinarius spilomius</i>	uncommon gilled mushrooms	fungi
	S		√		<i>cortinarius tabularis</i>	uncommon gilled mushrooms	fungi
	S		√		<i>cortinarius valgus</i>	uncommon gilled mushrooms	fungi
	S	√	√		<i>cortinarius variipes</i>	uncommon gilled mushrooms	fungi
	S	√	√		<i>cortinarius verrucisporus</i>	uncommon gilled mushrooms	fungi
	D		√		<i>udsonia monticola</i>	uncommon cup fungi	fungi
	S		√		<i>cyphellostereum laeve</i>	moss dwelling mushroom	fungi
	S	√	√		<i>destuntzia fusca</i>	rare false truffle	fungi
	S	√	√		<i>destuntzia rubra</i>	rare false truffle	fungi
	S	√	√		<i>dichostereum granulatum</i>	rare resupinates/polypores	fungi
	S	√	√		<i>elaphomyces subviscidus</i>	rare truffle	fungi
	S	√	√		<i>endogone acrogena</i>	rare zygomycete	fungi
	S	√	√		<i>endogone oregonensis</i>	rare zygomycete	fungi
	S		√		<i>Fayodia gracilipes (rainierensis)</i>	uncommon gilled mushrooms	fungi
	S		√		<i>galerina atkinsoniana</i>	moss dwelling mushroom	fungi
	S		√		<i>galerina cerina</i>	moss dwelling mushroom	fungi
	S		√		<i>galerina heterocystis</i>	moss dwelling mushroom	fungi
	S		√		<i>galerina sphagnicola</i>	moss dwelling mushroom	fungi
	S		√		<i>galerina vittaeformis</i>	moss dwelling mushroom	fungi
	S	√	√		<i>gastroboletus imbellus</i>	rare bolete	fungi
	S	√	√		<i>gastroboletus ruber</i>	rare bolete	fungi

		D	√		√	<i>gastroboletus subalpinus</i>	boletes	fungi	
		D			√	<i>gastroboletus turbinatus</i>	bolete	fungi	
		S	√		√	<i>gautieria magnicellaris</i>	rare false truffle	fungi	
		S	√		√	<i>gautieria othii</i>	rare false truffle	fungi	
		D	√		√	<i>gelatinodiscus flavidus</i>	rare cup fungi	fungi	
		S	√		√	<i>glomus radiatum</i>	rare zygomycetes	fungi	
		D			√	<i>gomphus bonarii</i>	chanterelle/gomphus	fungi	
		D			√	<i>gomphus clavatus</i>	chanterelle/gomphus	fungi	
		D			√	<i>gomphus floccosus</i>	chanterelle/gomphus	fungi	
		D			√	<i>gomphus kauffmanii</i>	chanterelle/gomphus	fungi	
		S	√		√	<i>gymnomyces</i> sp. nov. Trappe 1690, 1706, 1710	undescribed taxa, rare truffles/false truffles	fungi	
		S	√		√	<i>gymnomyces</i> sp. nov. Trappe 4703,5576	undescribed taxa, rare truffles/false truffles	fungi	
		S	√		√	<i>gymnomyces</i> sp. nov. Trappe 5052	undescribed taxa, rare truffles/false truffles	fungi	
		S	√		√	<i>gymnopilus punctifolius</i>	uncommon gilled mushrooms	fungi	
		D			√	√	<i>gyromitra californica</i>	uncommon cup fungi	fungi
		D			√	√	<i>gyromitra esculenta</i>	uncommon cup fungi	fungi
		D			√	√	<i>gyromitra infula</i>	uncommon cup fungi	fungi
		S			√	√	<i>gyromitra melaleucoides</i>	uncommon cup fungi	fungi
		D			√	√	<i>gyromitra montana (= gigas)</i>	uncommon cup fungi	fungi
		S	√		√		<i>hebeloma olympiana</i>	uncommon gilled mushrooms	fungi
		D	√		√		<i>helvella compressa</i>	rare cup fungi/elphin saddle	fungi
		D	√		√		<i>helvella crassitunicata</i>	rare cup fungi	fungi
		S	√		√		<i>helvella elastica</i>	rare cup fungi/elphin saddle	fungi
		D	√		√		<i>helvella maculata</i>	rare cup fungi/elphin saddle	fungi
		S	√		√		<i>hydnotrya</i> sp. nov. Trappe 787, 792	undescribed taxa, rare truffles/false truffles	fungi
		D	√		√		<i>hydnotrya subnix</i> sp. nov. Trappe 1861	undescribed taxa, rare truffles/false truffles	fungi
		D			√		<i>hydnum repandum</i>	tooth fungi	fungi
		S			√		<i>hydnum umbilicatum</i>	tooth fungi	fungi
		S	√		√		<i>hygophorus vernalis</i>	rare gilled mushrooms	fungi
		S	√		√		<i>hygophorus caeruleus</i>	uncommon gilled mushrooms	fungi
		S			√		<i>hygophorus karstenii</i>	uncommon gilled mushrooms	fungi
		D			√		<i>hypomyces luteovirens</i>	parasitic fungi	fungi
		D	√		√		<i>leucogater microsporus</i>	rare false truffle	fungi
		S	√		√		<i>macowanites lymanensis</i>	rare false truffle	fungi
		S	√		√		<i>macowanites mollis</i>	rare false truffle	fungi
		S	√		√		<i>martellia fragrans</i>	rare false truffle	fungi
		S	√		√		<i>martellia idahoensis</i>	rare false truffle	fungi
		S	√		√		<i>martellia monticola</i>	rare false truffle	fungi
		S	√		√		<i>martellia</i> sp. nov. Trappe 1700	undescribed taxa, rare truffles/false truffles	fungi
		S	√		√		<i>martellia</i> sp. nov. Trappe 311	undescribed taxa, rare truffles/false truffles	fungi
		S	√		√		<i>martellia</i> sp. nov. Trappe 5903	Undescribed taxa, rare truffles/false truffles	fungi
		S	√		√		<i>martellia</i> sp. nov. Trappe 649	undescribed taxa, rare truffles/false truffles	fungi
		S	√		√		<i>mycena hudsoniana</i>	uncommon gilled mushrooms	fungi
		S			√		<i>Mycena lilacifolia</i>	uncommon gilled mushrooms	fungi
		S			√		<i>mycena marginella</i>	uncommon gilled mushrooms	fungi
		S	√		√		<i>mycena monticola</i>	uncommon gilled mushrooms	fungi
		D	√		√		<i>mycena overholtsii</i>	uncommon gilled mushrooms	fungi

		S	√		√	<i>mycena quinaultensis</i>	uncommon gilled mushrooms	fungi
		S			√	<i>mycena tenax</i>	uncommon gilled mushrooms	fungi
		S			√	<i>mythicomycetes corneipes</i>	uncommon gilled mushrooms	fungi
		S	√		√	<i>neolentinus adherens</i>	rare gilled mushrooms	fungi
		S	√		√	<i>neolentinus kauffmanii</i>	uncommon gilled mushrooms	fungi
		S	√		√	<i>neoumula pouchetii</i>	rare cup fungi/western urnula	fungi
		D	√		√	<i>nivatogastrium nubigenum</i>	false truffle	fungi
		S	√		√	<i>octavianina macrospora</i>	rare false truffle	fungi
		S	√		√	<i>octavianina</i> sp. nov. trappe 7502	undescribed taxa, rare truffles/false truffles	fungi
√		S			√	<i>otidea leporina</i>	uncommon cup fungi	fungi
√		S			√	<i>otidea onotica</i>	uncommon cup fungi	fungi
√		D	√		√	<i>otidea smithii</i>	uncommon cup fungi	fungi
		D	√	√	√	<i>oxyporus nobilissimus</i>	noble polypore	fungi
		S			√	<i>phaeocollybia attenuata</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia californica</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia carmanahensis</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia dissiliens</i>	phaeocollybia	fungi
		S			√	<i>phaeocollybia fallax</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia gregaria</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia kauffmanii</i>	phaeocollybia	fungi
		S			√	<i>phaeocollybia olivacea</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia oregonensis</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia piceae</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia scatesiae</i>	phaeocollybia	fungi
		S	√		√	<i>phaeocollybia sipei</i>	phaeocollybia	fungi
		S			√	<i>phaeocollybia spadicea</i>	phaeocollybia	fungi
		D			√	<i>phellodon atratum</i>	tooth fungi	fungi
		D			√	<i>phlogoitis helvelloides</i>	jelly mushroom	fungi
		S	√		√	<i>pholiota albivelata</i>	uncommon gilled mushrooms	fungi
		S			√	<i>phytoconis ericetorum</i>	mushroom lichen	fungi
		S	√		√	<i>pithya vulgaris</i>	rare cup fungi	fungi
		S	√		√	<i>plectania latahensis</i>	rare cup fungi	fungi
		D			√	<i>plectania melastoma</i>	uncommon cup fungi	fungi
		S	√		√	<i>plectania milleri</i>	rare cup fungi	fungi
		S			√	<i>podostroma alutaceum</i>	uncommon cup fungi	fungi
√		D	√		√	<i>polyzellus multiplex</i>	black chanterelle	fungi
		S	√		√	<i>pseudaleuria quinaultiana</i>	rare cup fungi	fungi
		S			√	<i>ramaria abietina</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria amyloidea</i>	rare coral fungi	fungi
		D	√		√	<i>ramaria araiospora</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria aurantiisiccescens</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria botryis</i> var. <i>aurantiiramosa</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria celerivirescens</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria claviramulata</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria concolor</i> f. <i>marri</i>	rare coral fungi	fungi
		S			√	<i>ramaria concolor</i> f. <i>tsugina</i>	uncommon coral fungi	fungi
		S			√	<i>ramaria coulterae</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria cyaneigranosa</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria fasciculata</i> var. <i>sparsiramosa</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria gelatiniaurantia</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria gracilis</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria hilaris</i> var. <i>olympiana</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria largentii</i>	uncommon coral fungi	fungi
		S	√		√	<i>ramaria lorithamnus</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria maculatipes</i>	rare coral fungi	fungi
		S	√		√	<i>ramaria rainierensis</i>	rare coral fungi	fungi

	S	√	√	<i>ramaria rubella</i> var. <i>blanda</i>	uncommon coral fungi	fungi
	S	√	√	<i>ramaria rubribrunnescens</i>	rare coral fungi	fungi
	S	√	√	<i>ramaria rubrievanescens</i>	uncommon coral fungi	fungi
	S	√	√	<i>ramaria rubripermanens</i>	uncommon coral fungi	fungi
	S	√	√	<i>ramaria spinulosa</i>	rare coral fungi	fungi
	D	√	√	<i>ramaria stuntzii</i>	rare coral fungi	fungi
	S		√	<i>ramaria suecica</i>	uncommon coral fungi	fungi
	S	√	√	<i>ramaria thiersii</i>	uncommon coral fungi	fungi
	S	√	√	<i>ramaria verlotensis</i>	rare coral fungi	fungi
	S		√	<i>rhizopogon abietis</i>	false truffle	fungi
	S		√	<i>rhizopogon atroviolaceus</i>	false truffle	fungi
	S	√	√	<i>rhizopogon brunneiniger</i>	rare false truffle	fungi
	D	√	√	<i>rhizopogon evadens</i> var. <i>subalpinus</i>	rare false truffle	fungi
	S	√	√	<i>rhizopogon exiguus</i>	rare false truffle	fungi
	S	√	√	<i>rhizopogon flavofibrillosus</i>	rare false truffle	fungi
	S	√	√	<i>rhizopogon inquinatus</i>	rare false truffle	fungi
	S	√	√	<i>rhizopogon</i> sp. nov. <i>Trappe 1692</i>	undescribed taxa, rare truffles/false truffles	fungi
	S	√	√	<i>rhizopogon</i> sp. nov. <i>Trappe 1698</i>	undescribed taxa, rare truffles/false truffles	fungi
	S		√	<i>rhizopogon truncatus</i>	false truffle	fungi
	S	√	√	<i>rhodocybe nitida</i>	rare gilled mushrooms	fungi
	S	√	√	<i>rhodocybe speciosa</i>	rare gilled mushrooms	fungi
	D		√	<i>rickenella setipes</i>	moss dwelling mushroom	fungi
	S		√	<i>Russula mustelina</i>	uncommon gilled mushrooms	fungi
	D		√	<i>sarcodon fuscoindicum</i>	tooth fungi	fungi
	D		√	<i>sarcodon imbricatus</i>	tooth fungi	fungi
√	D			<i>sarcosoma mexicana</i>	uncommon cup fungi	fungi
	D		√	<i>sarcosphaera eximia</i>	uncommon cup fungi	fungi
	S	√	√	<i>sedecula pulvinata</i>	rare false truffle	fungi
	D		√	<i>sparassis crispa</i>	cauliflower mushroom	fungi
	D		√	<i>spathularia flavida</i>	uncommon cup fungi	fungi
	S		√	<i>stagnicola perplexa</i>	uncommon gilled mushrooms	fungi
	D		√	<i>thaxterogaster pingue</i>	false truffle	fungi
	S	√	√	<i>tricholoma venenatum</i>	rare gilled mushrooms	fungi
	S	√	√	<i>tricholomopsis fulvescens</i>	rare gilled mushrooms	fungi
	D	√	√	<i>tylopius pseudoscaber</i>	bolete	fungi
	S	√	√	<i>bryoria tortuosa</i>	rare forage lichen	lichens
	D	√	√	<i>bryoria subcana</i>	rare forage lichen	lichens
	D		√	<i>calicium abietinum</i>	pin lichens	lichens
	D		√	<i>calicium adaequatum</i>	pin lichens	lichens
	S		√	<i>calicium adpersum</i>	pin lichens	lichens
	D		√	<i>calicium glaucellum</i>	pin lichens	lichens
	D		√	<i>calicium viride</i>	pin lichens	lichens
	D		√	<i>cetrelia cetrarioides</i>	riparian lichens	lichens
	S	√	√	<i>cetraria californica</i>		lichens
	S		√	<i>chaenotheca brunneola</i>	pin lichens	lichens
	S		√	<i>chaenotheca chrysocephala</i>	pin lichens	lichens
	S		√	<i>chaenotheca ferruginea</i>	pin lichens	lichens
	S		√	<i>chaenotheca furfuracea</i>	pin lichens	lichens
	S		√	<i>chaenotheca subroscida</i>	pin lichens	lichens
	S		√	<i>chaenothecopsis pusilla</i>	pin lichens	lichens
	D		√	<i>cladonia norvegica</i>	additional lichens	lichens
	D		√	<i>collema nigrescens</i>	riparian lichens	lichens
	S		√	<i>cyphelium inquinans</i>	pin lichens	lichens
	D	√	√	<i>dendriscoaulon intricatum</i>	rare nitrogen-fixing lichen	lichens
	D	√	√	<i>dermatocarpon luridum</i>	aquatic lichens	lichens
	S		√	<i>heterodermia sitchensis</i>	additional lichens	lichens
	D	√	√	<i>hydrothyria venosa</i>	aquatic lichens	lichens
	S		√	<i>hygornia vittata</i>	additional lichens	lichens
	S	√	√	<i>hypogymnia duplicata</i>	rare leafy lichen	lichens

				√		<i>hypotrachyna revoluta</i>	additional lichens	lichens
					√	<i>leptogium burnetiae</i> var. <i>hirsutum</i>	riparian lichens	lichens
					√	<i>leptogium cyanescens</i>	riparian lichens	lichens
		√		√		<i>leptogium rivale</i>	aquatic lichens	lichens
					√	<i>leptogium saturninum</i>	riparian lichens	lichens
					√	<i>leptogium teretiusculum</i>	riparian lichens	lichens
		√		√		<i>lobaria hallii</i>	rare nitrogen-fixing lichen	lichens
		√	√	√		<i>lobaria linita</i>	rare nitrogen-fixing lichen	lichens
					√	<i>lobaria oregana</i>	nitrogen-fixing lichens	lichens
					√	<i>lobaria pulmonaria</i>	nitrogen-fixing lichens	lichens
					√	<i>lobaria scrobiculata</i>	nitrogen-fixing lichens	lichens
		√		√		<i>loxospora</i> sp. nov. "corallifera"		lichens
					√	<i>microcalicium arenarium</i>	pin lichens	lichens
					√	<i>mycocalicium subtile</i>	pin lichens	lichens
					√	<i>nephroma bellum</i>	nitrogen-fixing lichens	lichens
					√	<i>nephroma helveticum</i>	nitrogen-fixing lichens	lichens
				√		<i>nephroma isidiosum</i>	additional lichens	lichens
					√	<i>nephroma laevigatum</i>	nitrogen-fixing lichens	lichens
		√		√		<i>nephroma occultum</i>	rare nitrogen-fixing lichen	lichens
					√	<i>nephroma parile</i>	nitrogen-fixing lichens	lichens
					√	<i>nephroma resupinatum</i>	nitrogen-fixing lichens	lichens
		√		√		<i>niebla cephalota</i>		lichens
					√	<i>pannaria leucostictoides</i>	nitrogen-fixing lichens	lichens
					√	<i>pannaria mediterranea</i>	nitrogen-fixing lichens	lichens
		√		√		<i>pannaria rubiginosa</i>	rare nitrogen-fixing lichen	lichens
					√	<i>pannaria saubinetii</i>	nitrogen-fixing lichens	lichens
					√	<i>peltigera collina</i>	nitrogen-fixing lichens	lichens
					√	<i>peltigera neckeri</i>	nitrogen-fixing lichens	lichens
					√	<i>peltigera pacifica</i>	nitrogen-fixing lichens	lichens
		√		√		<i>pilophorus nigricaulis</i>	rare rock lichen	lichens
					√	<i>platismatia lacunosa</i>	riparian lichens	lichens
					√	<i>pseudocyphellaria anomala</i>		lichens
					√	<i>pseudocyphellaria anthraspis</i>	nitrogen-fixing lichens	lichens
					√	<i>pseudocyphellaria crocata</i>	nitrogen-fixing lichens	lichens
		√	√	√		<i>pseudocyphellaria rainierensis</i>	rare nitrogen-fixing lichen	lichens
				√		<i>ramalina pollinaria</i>	additional lichens	lichens
					√	<i>ramalina thrausta</i>	riparian lichens	lichens
					√	<i>stenocybe clavata</i>	pin lichens	lichens
					√	<i>stenocybe major</i>	pin lichens	lichens
					√	<i>sticta beauvoisii</i>	nitrogen-fixing lichens	lichens
					√	<i>sticta fuliginosa</i>	nitrogen-fixing lichens	lichens
					√	<i>sticta limbata</i>	nitrogen-fixing lichens	lichens
		√		√		<i>tholoma dissimilis</i>	rare leafy lichen	lichens
					√	<i>usnea longissima</i>	riparian lichens	lichens
				√		<i>felis lynx canadensis</i>	lynx	mammals
		√	√			<i>cryptomastix devia</i>	land snail/Puget devia	molluscs
		√	√			<i>cryptomastix hendersonii</i>	land snail/Columbia oregonian	molluscs
		√	√			<i>deroceras herperium</i>	slug/evening fieldslug	molluscs
		√	√			<i>hemophillia malonei</i>	slug/Malone jumping-slug	molluscs
		√	√			<i>hemphillia glandulosa</i>	slug/warty jumping-slug	molluscs
		√	√			<i>hemphillia pantherina</i>	slug/panther jumping-slug	molluscs
		√	√			<i>juga</i> n. sp. 3	freshwater snail/tall juga	molluscs
		√	√			<i>lyogyrus</i> n. sp. 1	freshwater snail/Columbia duskysnail	molluscs
		√	√			<i>monadenia fidelis minor</i>	land snail/Dalles sideband	molluscs
		√	√			<i>prophysaon dubium</i>	slug/papillose tail-dropper	molluscs
		√	√			<i>vespericola depressa</i>	land snail/Dalles hesperian	molluscs
		√	√			<i>allostropa virgata</i>	sugar stick	vascular plants
		√	√			<i>arceuthobium tsugense</i>	dwarf mistletoe	vascular plants
		√	√			<i>botrychium minganense</i>	mingan moonwort	vascular plants
		√	√			<i>botrychium montanum</i>	mountain grapefern	vascular plants
		√	√			<i>coptis asplenifolia</i>	spleenwort-leaved	vascular plants

								goldthread		
		S	√	√				<i>coptis trifolia</i>	threeleaf goldthread	vascular plants
		D	√	√				<i>corydalis aquae-gelidae</i>	cold-water corydalis	vascular plants
		D	√	√				<i>cypripedium fasciculatum</i>	clustered lady's slipper	vascular plants
		S	√	√				<i>cypripedium montanum</i>	mountain lady's slipper	vascular plants
		S	√	√				<i>habenaria orbiculata</i>	round-leaved orchid	vascular plants
			174	36	234	69				

<ROD C-61]

Total Suspected	202
Total Documented	120
Total Unknown	0
Total Species	322

Threatened, Endangered, and Sensitive Species [FP IV-51]

1. All project areas affected by management activities will be reviewed for Sensitive, Threatened, or Endangered plant and animal species.
2. A biological evaluation will be conducted before any ground disturbing activities occur which may adversely affect sensitive species.
3. Plant and Wildlife Conservation Strategies will be prepared for each sensitive species, guild or habitat.
4. When eagles are found, a survey and habitat inventory will be conducted in the Cowlitz, Nisqually, and Lewis Rivers, and other drainages to identify active bald eagle nests and potential habitat.

Consultation with the U.S. Fish and Wildlife Service will be required for each program activity or project that the Fish and Wildlife Service determines may affect threatened or endangered species and will be completed before any decision is made on the proposed project. Management activities must be conducted in such a manner that they will not impair recovery of any threatened or endangered species. <FP IV-51]

Deer and Elk [FP IV-53>

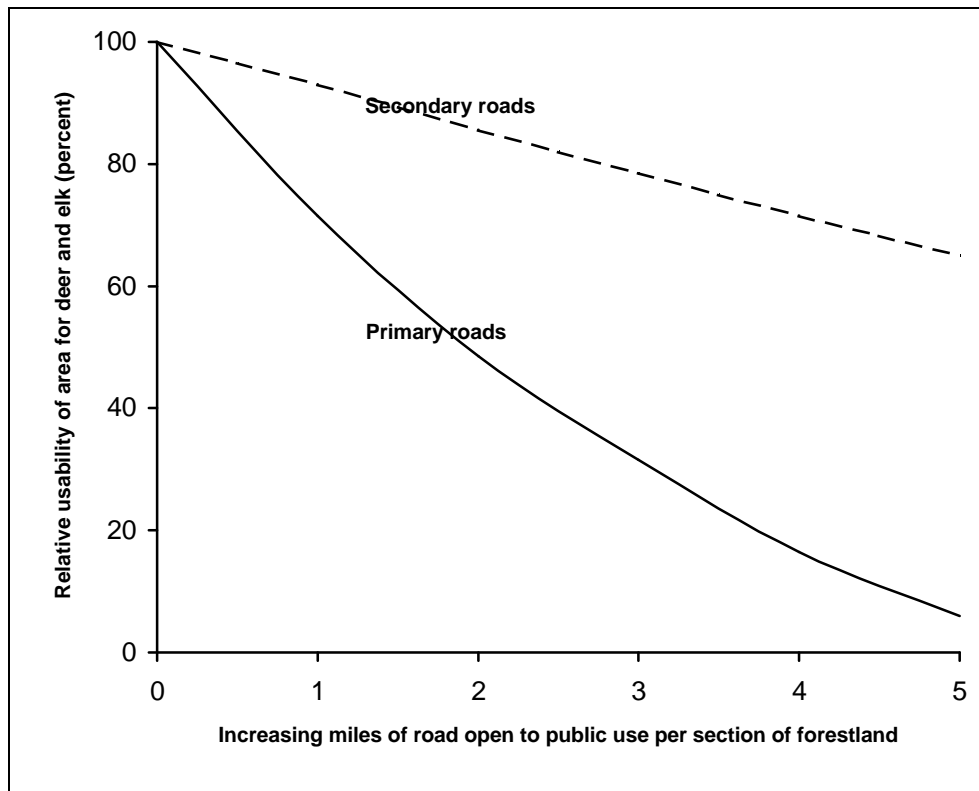
The following direction should be applied in all management areas within the biological deer/elk winter range, regardless of the assigned management area prescription:

1. In management areas with scheduled timber harvest, at least 75 percent of existing and future regeneration harvest areas should be fertilized and seeded with native forage species palatable to deer and/or elk. The need for fertilization and seeding will be determined on a case-by-case, interdisciplinary basis, before any on-the-ground application occurs. These treatments will utilize forage species appropriate to the area and consider reforestation difficulties which may be present. Forage seeding and fertilization should be considered within Biological Winter Range consistent with other objectives.
2. Road management objectives which are applicable if more restrictive than those in the assigned designated area or management area: Roads not needed for through traffic, access to an active project, or access to a specific recreation destination should be closed either permanently or seasonally, from December 1 to April 1, or decommissioned to reduce wildlife harassment. Through roads, and those to recreation destinations, should be managed to accommodate passenger car traffic.

<FP IV-53] [FP IV-26>

Roads which are open to vehicular traffic can significantly reduce the habitat capability for deer and elk. Achievement of the deer/elk management goal will require that the applicable road management standards and guidelines be met within the biological winter range. The intent is to move from the current average of about 3.0 miles of open road per square mile to an average of about 1.7 miles per square mile. The current mileage includes 1.2 miles of primary or through roads, and 1.8 miles of secondary roads. The Forest Service has no jurisdiction over primary roads, most of which are federal, state or county highways. The current 1.8 miles of secondary roads could be reduced to about 0.5 miles per square mile, leaving enough flexibility to manage for recreation, timber, and other resources (see Figure 2-1) <FP IV-26]

Figure 2-1. Generalized influence of increasing open road density on otherwise usable deer and elk habitat (derived from Willms 1971, Witmer 1981).



State game harvest regulations may also have a considerable effect on the degree to which habitat capability levels projected correspond with actual population levels. The period of this Forest Plan will provide an opportunity for the Forest and the State to refine mutual, quantified deer and elk population and habitat objectives. <FP IV-27]

Cooperation With Washington Department of Fish and Wildlife

[FP IV-53]

1. Projects, programs, policies, and other activities affecting fish and wildlife should receive advice and review of the Washington State Department of Fish and Wildlife.
2. To provide quality big game hunting, and to prevent over harvesting wildlife and the imposition of even more restrictive measures, seasonal access may be limited on portions of the Forest, in cooperation with the Washington State Department of Fish and Wildlife.
3. A deer and elk population survey should be taken at least every 5 years in cooperation with the Washington State Department of Fish and Wildlife.
4. A mountain goat population survey should be completed at least every 5 years in cooperation with the Washington State Department of Fish and Wildlife.

Special Habitat Management Objectives

1. Special habitats such as caves, cliffs, mineral licks, and talus slopes will be evaluated during project planning to determine biological significance, habitat value, and any necessary protection measures. Refer to standards and guidelines for caves under “Caves and Geologic Features,” page 2-33.
2. Hardwoods should be managed to provide mature and older stands for wildlife habitat.
3. Dry meadows one acre or larger in size (Ecoclass MD), oak patches, and dry shrublands meeting the criteria for Ecoclasses HO and SD should be evaluated during project planning to determine habitat value and necessary protection measures. Dry meadows include an influence area of typically 300 feet in width. Fifty percent of the suitable timberland within the 300-foot influence area should be in mature or old-growth trees. Eighty-five percent of the stands should be maintained in pole-size or larger trees for big game hiding cover. For management direction concerning moist or wet natural openings, refer to “Wetlands,” page 2-8, and “Riparian Reserve Widths,” page 2-5.

The total area of created openings contiguous to 30-acre or larger natural openings should normally not exceed one-third the size of the natural opening and not occupy more than one-third of the natural opening perimeter. Openings should not be created adjacent to any natural openings (regardless of size), unless adequate vegetation along the edge can be developed or retained in sufficient density to protect wildlife and visual management objectives. The determination of adequate vegetation will be made by an appropriate ID Team.

4. Activities in calving, fawning, and kidding areas should be timed to minimize disturbance and displacement of elk, deer, and mountain goats. Access and operations should be restricted between May 15 and July 1 in calving/fawning areas, and April 15 and July 1 in kidding areas.
5. Project planning should consider the need for direct habitat improvements such as forage seeding, fertilization, and prescribed burning, e.g., to benefit mountain goat, deer and elk.
6. Road, trail, and area closures may be employed to reduce wildlife harassment and disturbance to sensitive plants and fungi populations. Examples include but are not restricted to seasonal big game ranges, rutting and calving areas, nesting sites, fish spawning/holding areas, and other reproduction sites. Also included are places where unique, uncommon, or vulnerable habitats for wildlife, plants and fungi are found.

The objective of road closures is to mitigate negative effects of the roads on wildlife. For wildlife purposes, road closure priorities will be based on the location of important wildlife habitat, the amount of forest cover present, the proximity of riparian habitat, and the existing degree of visibility. Effective enforcement capability is essential in the design of road closures. Area closures

should be implemented in areas where “wheel-track,” off-road-driving-created roads are causing wildlife disturbance and displacement.

Habitat Management Objectives for Raptors and Herons

Bald Eagle

1. Picnicking, camping, blasting, firearm use, timber harvest, and low level aircraft operations should not be allowed within 1,300 feet of nests and roosts during periods of eagle use. These activities should also be regulated up to 2,600 feet from nests and roosts where eagles have line-of-sight vision. Critical nesting periods vary throughout the recovery area but generally fall between January 1 and August 31. Key wintering areas need protection from disturbance from approximately November 15 to March 15.
2. Site-specific conservation strategies should be prepared for each nest site, roost site, and feeding area.
3. Known nesting territories should be surveyed annually to determine occupancy, activity, success, and productivity of sites.
4. Additional management information may be found in the Pacific Bald Eagle Recovery Plan.

Peregrine Falcon

1. A survey of historic and potential nest sites should be completed within five years after approval of the Forest Plan.
2. Cooperate with the Washington Department of Fish and Wildlife to enhance opportunities to establish peregrine falcon populations on the Forest.
3. Site-specific management plans will be prepared for nest sites, foraging areas, and roost sites, if falcon use occurs. Management activities and human intrusion should be excluded from April 1 to August 1. Road and trail closures may be required when a nest site is active or occupied.
4. Additional management information may be found in the Peregrine Falcon Recovery Plan.

Golden Eagle

1. A survey of historic and potential nest sites should be completed within five years after approval of the Forest Plan.
2. Site-specific management plans should be prepared for nest sites, roost sites, and foraging areas, if eagle use occurs. Management activities and human intrusion should be excluded from March 1 to August 1. Road and trail closures may be required when a nest site is actually occupied by birds, or is in use for nesting purposes.

Osprey, Swainson's Hawk, Goshawk, Ferruginous Hawk, and Great Blue Heron

A protective area with a radius of approximately 660 feet should be established around each identified nest site. A management plan should be prepared for each nest site. Plans should describe specific requirements for each site, as well as for major feeding areas. The plans should be based on known reactions of birds to human intrusion, and include the following direction as a minimum:

1. Even-aged silvicultural practices, including clearcutting, shelterwood, and seed tree cutting, should not be permitted within the protective area. Other management activities, including intermediate timber harvesting, which do not significantly change the vegetative character may be permitted.
2. Management activities and human intrusion should not occur within the protective area when the nest is actually occupied by birds, or in use for nesting purposes. Road and trail closures may also be required.

See "Late-Successional Reserve Protection Buffers" later in this chapter for additional protection of the great gray owl.

Great-Blue Heron

A protective area with a radius of approximately 660 feet should be established around each heron rookery.

1. Management activities and human intrusion should not occur within the protective area from March 1 to August 31.
2. When the colony is no longer active or occupied, all restrictions on management activities may be removed. <FP IV-55]

Habitat Management Objectives for Mountain Goats [FP IV-27]

Habitat capability for mountain goats will be managed to provide a forage/cover ratio that maintains the present carrying capacity of 230 animals. This will be done by providing 50 percent of the area in optimal cover. The amount of timber harvest in mountain goat winter range will vary depending on the existing condition of the area. It will be minor, not exceeding four percent, and it will be performed in a manner which enhances the habitat.

Road management will be crucial to success in increasing goat habitat capability. Logging systems which do not require roads should be used unless no reasonable alternative exists. Most local and many collector roads should be closed (0.63 mile of open roads per square mile is the management direction). Timber harvest and road building should be precluded November 1 to June 15 in goat winter range, and all local and minor collector roads should be closed to traffic during the same period.

<FP IV-27]

Habitat Management Objectives for Bats [ROD C-43>

Provide additional protection for caves, mines, and abandoned wooden bridges and buildings that are used as roost sites for bats.

Most bat species occurring in the Pacific Northwest roost and hibernate in crevices in protected sites. Suitable roost sites and hibernacula, however, fall within a narrow range of temperature and moisture conditions. Sites commonly used by bats include caves, mines, snags and decadent trees, wooden bridges, and old buildings. Additional provisions for the retention of large snags and decadent trees are included in the standard and guideline for green tree patches in the Matrix. Caves, mines, and abandoned wooden bridges and buildings, however, are extremely important roost and hibernation sites, and require additional protection to ensure that their value as habitat is maintained.

This provision is intended to apply in Matrix forests and Adaptive Management Areas, and elements such as protection of known occupied caves should be considered for other land allocations. Conduct surveys of crevices in caves, mines, and abandoned wooden bridges and buildings for the presence of roosting bats, including fringed myotis, silver-haired bats, long-eared myotis, long-legged myotis, and pallid bats. For the purposes of this standard and guideline, caves are defined as in the Federal Cave Resources Protection Act of 1988 as “any naturally occurring void, cavity, recess, or system of interconnected passages which occur beneath the surface of the earth or within a cliff or ledge (. . . but not including any . . . man-made excavation) and which is large enough to permit an individual to enter, whether or not the entrance is naturally formed or man-made.” Searches should be conducted during the day in the summer (to locate day roosts and maternity colonies), at night during the late summer and fall (to locate night roosts, which are important for reproduction), and during the day in the winter (to locate hibernacula). If bats are found, identify the species using the site and determine for what purpose it is being used by bats. As an interim measure, timber harvest is prohibited within 250 feet of sites containing bats. Management standards and guidelines that may be included as mitigation measures in project or activity plans will be developed for the site. These standards will be developed following an inventory and mapping of resources. The purpose of the standards and guidelines will be protection of the site from destruction, vandalism, disturbance from road construction or blasting, or any other activity that could change cave or mine temperatures or drainage patterns. The size of the buffer, and types of activities allowed within the buffer, may be modified through the standards developed for the specific site. Retention of abandoned bridges or buildings must be made contingent on safety concerns.

Townsend’s big-eared bats are of concern to state wildlife agencies in both Washington and Oregon. These bats are strongly associated with caves, and are extremely sensitive to disturbance, especially from recreational cavers. When Townsend’s big-eared bats are found occupying caves or mines on federal land, the appropriate agency should be notified, and management prescriptions for that

site should include special consideration for potential impacts on this species.
<ROD C-44]

Riparian Reserve Standards and Guidelines for Wildlife [ROD C-37]

- FW-1 Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.
 - FW-2 Design, construct and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.
 - FW-3 Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.
 - FW-4 Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks occurring on federal lands. <ROD C-38]
[FP IV-70]
1. Stream and lake surveys should be conducted prior to management activities which could adversely affect wildlife or fish habitat. Ongoing stream and lake habitat surveys should identify opportunities for habitat and fish passage improvement.
 2. In marshes and wet meadows where vegetative encroachment is undesirable based on watershed analysis, trees, and other competing vegetation may be removed. <FP IV-70]

Late-Successional Reserve Protection Buffers [ROD C-19]

Protection Buffers are additional standards and guidelines from the Scientific Analysis Team Report for specific rare and locally endemic species, and other specific species in the upland forest matrix. The following rare and locally endemic species are likely to be assured viability if they occur within reserves. There might be occupied locations outside these areas, however, that will be important to protect as well. Protocols for surveys will be developed that will ensure a high likelihood of locating these occupied sites, and such surveys will be conducted prior to ground-disturbing activities within the known or suspected ranges and within the habitat types or vegetation communities occupied by these species, according to the implementation schedule for Survey and Manage components 1 and 2.

Nonvascular Plants:

Aleuria rhenana (*Fungus*) - This mushroom is widely distributed but rare and little known throughout its range, known from one collection from Mt. Rainier National Park. It is a conifer litter decomposer. Mitigation activities include conducting ecological studies and surveys to determine localities. Protect known populations if surveys continue to indicate that the population is rare. Defer ground-disturbing activities.

Otidea leporina, *O. onotica*, and *O. smithii* (*Fungi*) - These mushrooms occur in conifer duff, and are widespread in distribution but uncommon. They are dependent on older-age forests. Specific mitigation options include protecting older forests from ground disturbance where the species are located.

For the plants listed above, it is recommended that Regional or state office-level ecologists or botanists should:

1. Maintain a spatially explicit data base of all known sites in National Forests, and
2. Develop species or area management plans, to be implemented under the guidance of the regional botany programs.

Birds:

Great Gray Owl - Within the range of the northern spotted owl, the great gray owl is most common in lodgepole pine forests adjacent to meadows. It is also, however, found in other coniferous forest types. In some locations, such as on the Willamette National Forest west of the crest of the Cascade Range, at least some shelterwood harvesting seems to be beneficial for the species by opening up otherwise closed canopy cover for foraging. In doing so, consequences to species such as northern goshawk and American marten must be evaluated. Specific mitigation measures for the great gray owl, within the range of the northern spotted owl, include the following: provide a no-harvest buffer of 300 feet around meadows and natural openings one acre and larger in size and establish 1/4-mile protection zones around known nest sites. Encroaching trees may be cut within meadows for habitat enhancement after watershed analysis. Within one year of the signing of the Record of Decision for these standards and guidelines, develop and implement a standardized protocol for surveys; survey for nest locations using the protocol. Protect all future discovered nest sites as previously described. <ROD C-21]

Managed Late-Successional Areas Protection Buffers

[ROD C-26>

The following standards and guidelines incorporated from the Scientific Analysis Team Report will result in adding unmapped areas to Managed Late-Successional Areas that should be managed as indicated below. These standards and guidelines are to be applied wherever the species occurs outside of designated areas.

The following rare and locally endemic species are likely to be assured viability if they occur within designated areas. There might be occupied locations outside these areas, however, that will be important to protect as well. Protocols for surveys will be developed that will ensure a high likelihood of locating these occupied sites, and such surveys will be conducted prior to ground-disturbing activities within the known or suspected ranges and within the habitat types or vegetation communities occupied by these species, according to the implementation schedule for Survey and Manage components 1, 2, 3, and/or 4. (See Table 2-10.) When located, the occupied sites need to be protected as follows.

Nonvascular Plants:

Brotherella roellii (Moss) - This very rare species is endemic to the Washington Cascades north of Snoqualmie Pass and suspected to occur on the Gifford Pinchot National Forest. It occupies rotting logs in low-to-mid elevation old-growth stands having dense shade, closed canopies, and high humidity. Mitigation options include locating specific populations and protection of large decay class 3, 4, and 5 logs and canopy closure greater than 70 percent. Defer management activities that conflict with maintaining suitable habitat characteristics and known populations levels. The implementation schedule for this species is the same as for survey and manage components 1 and 3.

Buxbaumia piperi, *B. viridis*, *Rhizomnium nudum*, *Schistostega pennata*, and *Tetraphis geniculata* (Mosses) - Most of these species are fairly rare (the exception is *B. piperi*). They occur on rotten logs and some organic soil, and are shade dependent, occurring in old-growth forests. *S. pennata* occurs only in mature western red cedar forests in the Olympic National Forest and in the Washington Cascades. Mitigation activities include surveying to determine presence and distribution; and, where located, maintaining decay class 3, 4, and 5 logs and greater than 70 percent closed-canopy forest habitats for shade. Shelterwood and thinning prescriptions for timber harvest will cause their demise, as logs dry out. The implementation schedule for this species is the same as for survey and manage components 1 and 3.

Polyozellus multiplex (Fungus) - Ecologically, this mushroom was considered in the same species group as *Albatrellus caeryliopus* and others, listed earlier in the SAT Report under species aided by marbled murrelet mitigation measures. *P. multiplex*, however, occurs in higher elevations of the Cascades in silver fir and mixed conifer (and is thus outside the range of marbled murrelet mitigations). It can be locally abundant and is a mycorrhizal species important to forest health. Like its group associates, it is a good indicator of old-growth forests. Mitigation activities for this species include conducting surveys to define its distribution, and studies to assess its habitat requirements. The implementation schedule for this species is the same as for survey and manage components 1 and 3.

Sarcosoma mexicana (Fungus) - This mushroom occurs in deep conifer litter layers in older forests. It is uncommon to rare and is found in the Oregon and Washington Coast Range into British Columbia and is known to occur on the Gifford Pinchot National Forest. Mitigation activities include surveying for locations and protecting deep litter layers of older forests where found. Defer prescribed burning of understory or other activities which would not retain a deep litter layer. The implementation schedule for this species is the same as for survey and manage component 3.

For the plants listed above, it is recommended that regional and state ecologists or botanists should: (1) maintain a spatially explicit data base of all known sites in National Forests and (2) develop species or area management plans, to be implemented under the guidance of the regional botany programs.

Amphibians:

Larch Mountain Salamander - Because of the narrow distribution of this species, mostly within the Columbia River Gorge, primary emphasis should be to survey and protect all known sites. Sites must be identified based on fall surveys conducted using a standardized protocol. Known sites are included within boundaries of conservation areas and under these guidelines, are not to be disturbed. Surveys are needed at additional sites in the forest matrix along the Columbia River Gorge. Key habitat is mossy talus protected by overstory canopy. Avoiding any ground-disturbing activity that would disrupt the talus layer where this species occurs is the primary means of protection. Once sites are identified, maintain 40 percent canopy closure of trees within the site and within a buffer of at least the height of one site-potential tree or 100 feet horizontal distance, whichever is greater, surrounding the site. Larger buffer widths are appropriate upslope from protected sites on steep slopes. Partial harvest may be possible if canopy closure can be retained; in such cases logging must be conducted using helicopters or skyline cable systems to avoid disturbance of the talus layer. The implementation schedule for this species is the same as for survey and manage components 1 and 2. <ROD -C-28]