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April 2003

Draft Supplemental Environmental Impact Statement

To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines

Forest Service National Forests in Regions 5 and 6
and Bureau of Land Management Districts
in Washington, Oregon, and California
Within the Range of the Northern Spotted Owl

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Cover artwork compliments of Elizabeth I. Gayner. Drawing includes the Great gray owl (*Strix nebulosa*), an orchid (*Cypripedium montanum*), a mushroom (*Gyromitra californica*), and a snail (*Monadenia fidelis*).

BLM/OR/WA/PL-03/023+1792

United States Department of Agriculture	Forest Service	R-6	OR/ WA	Bureau of Land Management	United States Department of Interior

Reply Refer To:2670 (FS)/ 1736 (BLM) (OR-935) **Date: April 15, 2003**

Dear Reader:

This letter announces the release of the Draft Supplemental Environmental Impact Statement (SEIS) to remove or modify the Survey and Manage Mitigation Measure Standards and Guidelines. The Forest Service and Bureau of Land Management (BLM) (the Agencies) prepared this Draft SEIS to present the environmental consequences of undertaking different strategies for conserving rare and little known species that are associated with late-successional and old-growth forests within the range of the northern spotted owl. This Draft SEIS supplements the analyses contained in the Final SEIS (2000) for Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, and the Final SEIS (1994) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (the Northwest Forest Plan).

The underlying need for this SEIS is to achieve the objectives originally established in the Northwest Forest Plan, to the extent those objectives are frustrated by the Survey and Manage Standards and Guidelines. The purposes of the SEIS are to:

1. Continue to provide for diversity of plant and animal communities in accordance with the National Forest Management Act and conserve rare and little known species that may be at risk of becoming listed under the Endangered Species Act.
2. Reduce the Agencies' cost, time, and effort associated with rare and little known species conservation.
3. Restore the Agencies' ability to achieve resource management objectives that were established under the Northwest Forest Plan.

Three alternatives, including no action, are considered in detail in the Draft SEIS. The preferred alternative is Alternative 2 with mitigation. The preferred alternative would remove the Survey and Manage Mitigation Measure and the Agencies would rely on their existing Special Status Species Programs to conserve rare species. A decision to select one of the action alternatives would amend the management direction in all 28 Forest Service land and resource management plans and BLM resource management plans in the Northwest Forest Plan area.

The Agencies are soliciting comments on the Draft SEIS. Comments will be accepted via hardcopy mail, facsimile, and the internet. Comments should be sent to:

Survey and Manage
Argonne National Laboratory
EAD/900
9700 South Cass Avenue
Argonne, IL 60439

Facsimile: 1-866-542-5904 (toll free)
Internet: http://web.ead.anl.gov/surveyandmanage

The 90-day comment period begins on May 9, 2003, and closes on August 8, 2003. The Agencies ask that those submitting comments on the Draft SEIS make them as specific as possible with references to page numbers and chapters of the document. Comments should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Comments received in response to this solicitation, including names and addresses, will be considered part of the public record on this proposal and are available for public inspection. Comments, including names and addresses, may be published as part of the Final SEIS. If you wish to withhold your name or address from public review, or from disclosure under the Freedom of Information Act (FOIA), you must state this prominently at the beginning of your written comments. Additionally, pursuant to 7 CFR 1.27(d), any person may request that submissions be withheld from the public record by showing how the FOIA permits such confidentiality. Persons requesting such confidentiality should be aware that under FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The requester will be informed of the agencies' decision regarding the request for confidentiality. Where the request is denied, the comments will be returned to the requester and the requester will be notified that the comments may be resubmitted with or without name and address. Comments submitted anonymously will be accepted and considered. Anonymous comments do not create standing or a record of participation. All submissions from organizations and business, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

For further information on this SEIS, contact Jerry Hubbard, Survey and Manage SEIS Team Logistics Coordinator, at P.O. Box 2965, Portland, OR 97208; via telephone at 503-326-2355; or via facsimile at 503-326-2396.

Sincerely,

RICHARD C. PRATHER
SEIS Team Leader
Interagency Survey and Manage SEIS Team

Draft Supplemental Environmental Impact Statement

To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines

Forest Service National Forests in Regions 5 and 6
and Bureau of Land Management Districts
in Washington, Oregon, and California
Within the Range of the Northern Spotted Owl

April 2003

Lead Agencies: Forest Service - U.S. Department of Agriculture
Bureau of Land Management - U.S. Department of Interior

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Gale Norton, Secretary of Interior

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Send comments to:

via mail: Survey and Manage
Argonne National Laboratory
EAD/900
9700 South Cass Avenue
Argonne, IL 60439

via facsimile 1-866-542-5904

via the internet http://web.ead.anl.gov/surveyandmanage

Comments must be received by August 8, 2003.

Reviewers should provide their comments during the review period of the draft environmental impact statement. This will enable the Agencies to analyze and respond to the coments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewer's position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 552 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, 1986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

Notice

Readers should note that the Secretary of Agriculture and the Secretary of Interior are the responsible officials for this proposed action. Therefore, no administrative review (appeal) through the Forest Service will be available on the Record of Decision under 36 CFR 217, and no administrative review (protest) through the Bureau of Land Management will be available on the Record of Decision under 43 CFR 1610.5-2. Because there is no administrative review of the decision, the Record of Decision will not be signed until 30 days after the Notice of Availability for the Final SEIS appears in the Federal Register (see 40 CFR 1506.10(b)).

Abstract

This Supplemental Environmental Impact Statement examines the environmental effects of a proposal by the Forest Service and BLM to eliminate or modify the Survey and Manage Standards and Guidelines of the Northwest Forest Plan. Alternatives considered in detail are: (1) Alternative 1, No-Action; (2) Alternative 2, an alternative that would amend agency land and resource management plans by removing the Survey and Manage mitigation measure; and, (3) Alternative 3, an alternative that would amend agency land and resource management plans by modifying the Survey and Manage Standards and Guidelines. The need for the proposal was generated by concerns that the Survey and Manage Standards and Guidelines are frustrating Forest Service and BLM efforts to accomplish resource management objectives of the Northwest Forest Plan. The 304 Survey and Manage species affected by this proposal were analyzed to determine the environmental consequences under the 3 alternatives. Analyses show that the Survey and Manage Standards and Guidelines and the Special Status Species Programs add protection and reduce risk to species. Recognizing there is much that remains unknown about many of the species, 141 species remain at high risk of extirpation under all alternatives due to factors beyond the control of the Forest Service and BLM. When compared to Alternative 1, there are 47 and 7 species that would be at high risk of extirpation under Alternatives 2 and 3, respectively. These species are not at high risk of extirpation under Alternative 1. The analysis also showed annual timber harvest would be 100 MMBF higher under Alternative 2 and 75 MMBF higher under Alternative 3 compared to Alternative 1, No-Action. Cost of the No-Action Alternative was projected to be $25.9 million annually for the next 10 years, dropping to $15.3 million annually thereafter. Short-term annual costs of Alternatives 2 and 3 were $7.5 million and $11.8 million, respectively. After 10 years, those annual costs fall to $7.1 million and $9.2 million, respectively. Alternatives 2 and 3 showed increases in annual employment and annual hazardous fuel treatment acreage relative to Alternative 1, No-Action. The preferred alternative is Alternative 2 with mitigation that eliminates the high risk of extirpation for 47 species mentioned above. It is preferred because it best meets the purpose and need. Specifically, Alternative 2 conserves rare and little known species, reduces cost and effort, and allows for achievement of healthy forests and timber outputs.

Acronyms and Abbreviations

ACEC	Areas of Critical Ecological Concern
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEMAT	Forest Ecosystem Management Assessment Team
FLPMA	Federal Land Policy and Management Act
FR	Federal Register
FSM	Forest Service Manual
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
ISMS	Interagency Species Management System
MMBF	million board feet
MUSY	Multiple Use Sustained Yield Act
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NOAA Fisheries	National Marine Fisheries Service
NWFP	Northwest Forest Plan
ONHP	Oregon Natural Heritage Program
ONHIC	Oregon Natural Heritage Information Center
PCFFA	Pacific Coast Federation of Fishermen's Association
PSQ	Probable Sale Quantity
PM	particulate matter
REO	Regional Ecosystem Office
RIEC	Regional Interagency Executive Committee
ROD	Record of Decision
SEIS	Supplemental Environmental Impact Statement
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior

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Summary

Introduction

This Supplemental Environmental Impact Statement (SEIS) presents the environmental consequences of undertaking different strategies for assuring the continued existence of rare and little known species that are associated with late-successional and old-growth forests within the range of the northern spotted owl. Currently, 304 species and 4 arthropod guilds are managed under the Survey and Manage Standards and Guidelines. A proposal to eliminate the Survey and Manage Standards and Guidelines was put forth as the "proposed action" and was made public on October 21, 2002, through a Notice of Intent published in the Federal Register (67 FR 64601). The Notice of Intent provided preliminary information about the proposed action and invited public comment.

The existing Survey and Manage Standards and Guidelines were originally added to agency land and resource management plans as part of the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (the Northwest Forest Plan). The Northwest Forest Plan primarily takes a landscape approach to providing habitat for late-successional and old-growth forest related species on Forest Service and Bureau of Land Management (BLM) (hereafter referred to as the Agencies) administrative units in western Washington and Oregon, and northwestern California. The Survey and Manage mitigation measure was added to the basic elements of the Northwest Forest Plan to provide additional certainty that the plan would provide for rare and little known species. In January 2001, the Agencies modified the Survey and Manage Standards and Guidelines by identifying needed management, clarifying language, eliminating inconsistent and redundant practices, and establishing an annual species review process. Those modifications were embodied in the January 2001 *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*.

Why is the Action Being Proposed?

Agency managers and the public have raised concerns that the Survey and Manage Standards and Guidelines are frustrating the Agencies' ability to meet the resource management goals and objectives as set forth in the Northwest Forest Plan. They assert that the costs of the Survey and Manage mitigation measure, both in dollars and time, are excessive. They also suggest that because 80 percent of federally managed lands within the Northwest Forest Plan area are allocated to Reserves, it is not necessary to manage substantially more land for late-successional and old-growth related species. The Survey and Manage Standards and Guidelines require management of species sites within areas allocated to multiple use such as timber harvest or watershed restoration. Such management can prevent timber sales and other activities such as habitat conservation and restoration from going forward.

The underlying needs to which the Agencies are responding are healthy forest ecosystems and a sustainable supply of timber and other forest products, to the extent these are frustrated by the Survey and Manage Standards and Guidelines.

What Would It Mean Not to Meet the Need?

To answer this question, the No-Action Alternative (Alternative 1) was analyzed. Alternative 1 continues implementation of all current elements of the Northwest Forest Plan including the Survey and Manage mitigation measure, the underlying land and resource management plans, and relevant agency programs and policies. Alternative 1 is described in detail in Chapter 2.

What Action is Proposed?

The Agencies propose to amend 28 land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines. This proposal is referred to as the "proposed action" or Alternative 2. Under Alternative 2, the Agencies would rely on their existing Special Status Species Programs to conserve rare species. Alternative 2 is described in detail in Chapter 2.

Are There Other Alternatives that Would Meet the Need?

During the scoping phase for this project (October through December 2002) many comments were received both internally and externally. Commenters suggested various ideas for meeting the need, and many of these are addressed in Chapter 2 under "Alternatives Considered, but Eliminated from Detailed Study". Several of these ideas were also incorporated into another alternative, Alternative 3. Alternative 3 would remove the uncommon species from the Survey and Manage mitigation measure while retaining rare species. Alternative 3 would also remove the requirement to conduct pre-disturbance surveys in forest stands that have not developed late-successional and old-growth characteristics. Alternative 3 is described in detail in Chapter 2.

What are the Effects of the Alternatives?

This section summarizes the environmental consequences of the three alternatives discussed in detail in Chapter 3&4.

Survey and Manage Species

The environmental consequences analysis in this SEIS affirms previous analyses in the Northwest Forest Plan Final SEIS (1994) and the Survey and Manage Final SEIS (2000). Based on those analyses, the Survey and Manage Standards and Guidelines generally add protection to species and generally improve the outcomes for numbers, populations, and distribution. However, this is not true in all cases. In the Survey and Manage Final SEIS 2000, there were many species for which there was insufficient information to draw a conclusion. In addition, even with the Survey and Manage Standards and Guidelines, there was insufficient habitat to maintain stable, well-distributed populations for some species.

In addition to examining numbers, populations, and distribution, the analysis in this SEIS examines the following question: Is there a high risk of species extirpation in the Northwest Forest Plan area? There are 304 species and 4 arthropod guilds currently included in the Survey and Manage Standards and Guidelines. The results of the analysis indicate that some species are at high risk for extirpation and, for some other species, there is inadequate information to draw a conclusion under any alternative (USDA, USDI 2000a). Table S-1 displays the number of Survey and Manage species at high risk for extirpation and the number of species where there is inadequate information to draw a conclusion.

There would be a substantial difference in the outcome regarding a high risk of extirpation in the Northwest Forest Plan area between Alternatives 1 and 2 for 47 species. This includes 1 lichen, 1 bryophyte, 3 mollusks, and 42 fungi species. For these species, there is not a high risk of extirpation under Alternative 1 while there is a high risk of extirpation under Alternative 2. Under Alternative 2, the Agencies' Special Status Species Programs would not provide for these species to continue to exist in the Northwest Forest Plan area because the programs sometimes would not cover large or important parts of a species' range.

There would be a substantial difference in the outcome regarding a high risk of extirpation in the Northwest Forest Plan area between Alternatives 1 and 3 for seven fungi species. For these species there is not a high risk of extirpation under Alternative 1, while there is a high risk of

Table S-1. Risk for Extirpation of Survey and Manage Species and Guilds

	Alternative 1	Alternative 2	Alternative 3
High Risk of Extirpation not due to federal actions [1]	137	137	137
High Risk of Extirpation due to actions under the alternative	0	47	7
Not at High Risk for Extirpation	141	94	133
Insufficient Information to Determine Risk	30	30	31

[1] Factors causing high risk are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, and narrow ecological amplitudes.

extirpation under Alternative 3. Under Alternative 3, the Agencies' Special Status Species Programs would not provide for these species to continue to exist in the Northwest Forest Plan area because the programs sometimes would not cover large or important parts of a species' range.

For some of the species, even though they would not be at high risk of extirpation range-wide in the Northwest Forest Plan area, they would be at high risk of extirpation in a portion of their range under Alternatives 2 and 3. For Alternative 2, this includes four lichens, one bryophyte, nine mollusks, one vascular plant, and the Oregon red tree vole. For Alternative 3, this includes one mollusk, one vascular plant, and the Oregon red tree vole.

Species Mitigation

Measures could be used to mitigate the adverse environmental impacts for species that would be at high risk of extirpation in all or a portion of the Northwest Forest Plan area under Alternatives 2 and 3, but not under Alternative 1. Mitigation for these effects could include management of known sites not protected by reserves or the Agencies' Special Status Species Programs. In addition, mitigation for some of these species could include pre-project clearances. As a result of this mitigation, these species would not be at a high risk of extirpation.

There are 141 species at high risk of extirpation in the Northwest Forest Plan area under all alternatives. These species are at high risk due to factors such as limited potential habitat and few populations on federally managed lands, potential for stochastic events, low number of individuals, limited distribution, and narrow ecological amplitudes. Since the high risk is not a result of federal actions, no alternative or mitigation could be proposed that would eliminate this risk (USDA, USDI 1994a and USDA, USDI 2000a).

Timber Harvest

The amount of late-successional forest projected for management of known sites reduces the acres of late-successional forest in the Matrix and Adaptive Management Areas available for harvest. The projected Probable Sale Quantity (PSQ) reductions shown below are from the current 805 million board foot (MMBF) baseline.

Under Alternative 1, there would be a 130 MMBF reduction in PSQ due to management of known sites.

Under Alternative 2, there would be a 30 MMBF reduction in PSQ due to management of known sites. Mitigation measures for 63 species, including management of known sites under Alternative 2, would reduce PSQ an additional 10 MMBF. Under Alternative 2 with mitigation, there would be a 40 MMBF reduction in PSQ.

Under Alternative 3, there would be a 55 MMBF reduction in PSQ due to management of known sites. Mitigation measures for 10 species, including management of known sites under Alternative 3, would reduce PSQ an additional 3 MMBF. Under Alternative 3 with mitigation, the reduction in PSQ would remain at 55 MMBF (due to rounding).

Wildland and Prescribed Fire

Under Alternative 1, the annual acres available for hazardous fuel treatments would be 134,100 acres. The cost per acre to manage for species would be $134.

Under Alternative 2, the annual acres available for fuel treatments would be 158,200, an increase of 24,100 acres compared to Alternative 1. Fuel treatment costs to manage for species would be $39 per acre, a decrease of $95 compared with Alternative 1. Mitigation measures for 63 species under Alternative 2 would result in 1,700 fewer acres available for annual fuel treatments and an increase in $5 per acre to protect species compared to Alternative 2 without mitigation.

Under Alternative 3, the annual acres available for fuel treatments would be 153,100, an increase of 19,400 acres compared to Alternative 1. Fuel treatment costs to manage for species would be $52 per acre, a decrease of $82 compared with Alternative 1. Mitigation measures for ten species under Alternative 3 would result in a negligible effect on acres available for annual fuel treatments and cost per acre to protect species compared to Alternative 3 without mitigation.

Cost of Management

Under Alternative 1, the Agencies' short-term annual costs would be $25.9 million. Long-term annual costs (after 10 years) would decrease to $15.3 million.

Under Alternative 2, the Agencies' short-term annual costs would be $7.5 million. This would result in a short-term cost savings of $18.4 million per year compared to Alternative 1. The Agencies' long-term annual costs would be $7.1 million. This would result in a long-term cost savings of $8.2 million per year compared to Alternative 1. The cost of possible mitigation under Alternative 2 would be $0.6 million dollars annually, mostly due to the need for additional clearance surveys.

Under Alternative 3, the Agencies' short-term annual costs would be $11.8 million. This would result in a short-term cost savings of $14.1 million per year compared to Alternative 1. The Agencies' long-term annual costs would be $9.2 million. This would result in a long-term cost savings of $6.1 million per year compared to Alternative 1. The cost of possible mitigation under Alternative 3 would be negligible.

Socioeconomics

All alternatives have an adverse effect on PSQ that was not anticipated in the Northwest Forest Plan Final SEIS (see 2000 Survey and Manage Final SEIS, p. 429). The full harvest level under the Northwest Forest Plan is currently 805 MMBF which would support 7,309 timber-related jobs.

Under Alternative 1, the timber-related employment decrease from full Northwest Forest Plan harvest level would be 1,180. Survey-related employment would provide an additional 533 jobs. This would result in a net decrease of 647 jobs compared to projected employment under the Northwest Forest Plan.

Under Alternative 2, the timber-related employment decrease from full Northwest Forest Plan harvest level would be 272 jobs. Survey-related employment would provide an additional 154 jobs. This would result in a net decrease of 118 jobs. Possible mitigation under this alternative would result in a net decrease of 196 jobs when considering both timber and survey-related jobs.

Under Alternative 3, the timber-related employment decrease from full Northwest Forest Plan harvest level would be 499 jobs. Survey-related employment would provide an additional 242 jobs. This would result in a net decrease of 257 jobs compared to projected employment under the Northwest Forest Plan. Possible mitigation under this alternative would result in negligible effects on employment levels.

Other Resources

For the other resources, including the aquatic ecosystem, late-successional forest ecosystem, air quality, water quality, soil productivity, late-successional mammals (excluding red tree vole), late-successional birds (excluding great gray owl), threatened and endangered species, and species associated with early-successional forest, the alternatives would either have relatively minor effects or would not change the analysis or outcomes developed in the Northwest Forest Plan Final SEIS and implemented through its Record of Decision (USDA, USDI 1994b). Table S-2 displays a brief summary of the environmental consequences of the alternatives.

Table S-2. Summary of environmental consequences of the alternatives.

		Alternative 1	Alternative 2		Alternative 3	
			Un-mitigated	Mitigated	Un-mitigated	Mitigated
Species and Guilds	High Risk of Extirpation not due to federal actions [1]	137	137	137	137	137
	High Risk of Extirpation due to actions under the alternative	0	47	0	7	0
	Not at High Risk for Extirpation	141	94	141	133	141
	Insufficient Information to Determine Risk	30	30	30	31	30
Effect on Annual Timber Harvest (MMBF)		-130	-30	-40	-55	-55
Short-term Annual Cost ($ Millions)		$25.9	$7.5	$8.1	$11.8	$11.8
Long-term (10 years) Annual Cost ($Millions)		$15.3	$7.1	$7.7	$9.2	$9.2
Employment Decrease from Full Harvest Level (per Northwest Forest Plan)		-1,180	-272	-363	-499	-499
Survey Related Employment		+533	+154	+167	+242	+242
Hazardous Fuel Treatment (Annual Acres)		134,100	158,200	156,500	153,500	153,500
Hazardous Fuel Treatment (Cost to Protect Species/Acre)		$134	$39	$44	$52	$52

[1] Factors causing high risk are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, and narrow ecological amplitudes.

What Factors Will be Used in Making the Decision Between Alternatives?

The Secretary of Agriculture and the Secretary of Interior will jointly decide which alternative best meets the underlying need for this proposal. In making the decision, they will also weigh how well each of the alternatives meets the following purposes:

1. Provide for diversity of plant and animal communities in accordance with the National Forest Management Act and conserve rare and little known species that may be at risk of becoming listed under the Endangered Species Act.

It has been longstanding policy in both the Forest Service and BLM to avoid taking actions that would lead to the listing of species under the Endangered Species Act. In addition, the Forest Service has regulations that require it "to provide for diversity of plant and animal communities based on the suitability and capability of the specific land area" (16 USC 1604(g)(3)(B).

2. Reduce the Agencies' cost, time, and effort associated with rare and little known species conservation.

Pre-disturbance surveys, strategic surveys, and other elements of the Survey and Manage Standards and Guidelines are expensive and use a disproportionate share of available agency funding. Required pre-disturbance surveys can delay projects for 2 years and draw valuable personnel and resources away from other conservation efforts.

3. Restore the Agencies' ability to achieve resource management objectives that were established under the Northwest Forest Plan.

Some Survey and Manage species are so numerous that the acreage needed to protect them far exceeds that projected in previous analyses. As a result, some project areas become dotted with dozens of known sites, severely reducing project size or making the entire project infeasible. This problem has limited the Agencies' ability to restore forest health including thinning in Late-Successional Reserves and Riparian Reserves, and fuel treatments to reduce the threat of catastrophic wildfire to watersheds and communities at risk. This problem has also contributed to the Agencies' inability to achieve consistent levels of timber outputs and meet the timber harvest objectives in the Northwest Forest Plan.

What Monitoring is Necessary that is Not Included in the Proposed Action or Alternatives?

Monitoring will continue in accordance with existing monitoring requirements for the Northwest Forest Plan and for the land and resource management plans for each of the Forest Service and BLM administrative units within the Northwest Forest Plan area. No new monitoring requirements are proposed under any of the alternatives.

Which Alternative is Preferred?

Based on consideration of the environmental consequences, Alternative 2, with mitigation as described in Chapter 3&4, was found to best meet the purpose and need, and is the preferred alternative.

Chapter 1 - Purpose and Need

Introduction

This chapter specifies the purpose and need to which the Forest Service and Bureau of Land Management (BLM) (the Agencies) are responding in developing the proposed action and alternatives assessed in this Supplemental Environmental Impact Statement (SEIS). The Agencies propose to amend 28 land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines. This includes land and resource management plans of the Forest Service and resource management plans of the BLM (collectively referred to as land and resource management plans) in the Pacific Northwest and northern California (Figure 1-1). The existing Survey and Manage Standards and Guidelines were added to land and resource management plans as part of the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (aka the Northwest Forest Plan). The Northwest Forest Plan was later modified by the January 2001 *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines.* Although the 1994 and 2001 Records of Decision actually amended 28 land and resource management plans, the overall resource management strategy was and is continued to be called the Northwest Forest Plan.

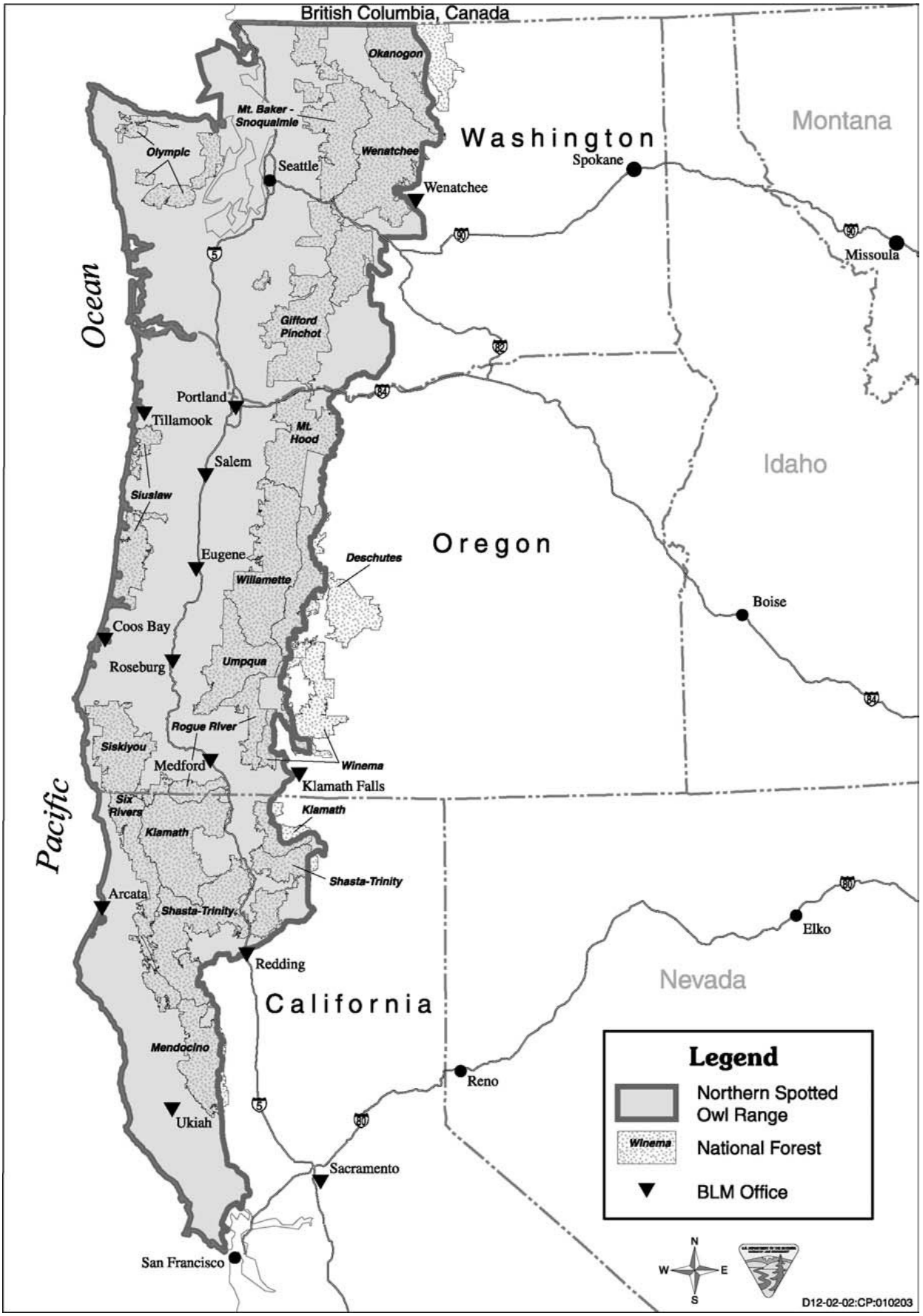
The Survey and Manage Standards and Guidelines currently provide procedures and requirements for the management of 304 rare and/or little-known species (and 4 arthropod guilds) within the Northwest Forest Plan area. Species include fungi, lichens, vascular plants, arthropods, mollusks, bryophytes, and vertebrates. The Survey and Manage Standards and Guidelines include species that are closely associated with late-successional or old-growth forests and for which other elements of the Northwest Forest Plan (such as reserves or other standards and guidelines) do not provide a reasonable assurance of persistence. Background information about the Survey and Manage Standards and Guidelines can be found in Chapter 2.

The Need

Impacts of the Survey and Manage Standards and Guidelines have been much greater than the minor impacts anticipated when the mitigation measure was added to the SEIS for the Northwest Forest Plan in 1994 (see Reasons for the Purpose and Need section later in this chapter). As a result, they are frustrating the achievement of the stated needs of the Northwest Forest Plan "… protect the long-term health of our forests, our wildlife and our waterways …", "Where sound management policies can preserve the health of forest land, [timber] sales should go forward", and "… produce a predictable and sustainable level of timber sales and nontimber resources that will not degrade or destroy the environment." (USDA, USDI 1994a, p. 1-4 and USDA, USDI 1994b, p. 3.) The Survey and Manage Standards and Guidelines are frustrating the Agencies' ability to protect the long-term health of forests, wildlife, and waterways because they substantially restrict forest health treatments, such as fuels reduction, and Late-Successional Reserve and Riparian Reserve thinning. They are also preventing many timber sales that were predicted under the Northwest Forest Plan from being implemented.

The underlying needs to which the Agencies are responding are healthy forest ecosystems and a sustainable supply of timber and other forest products, to the extent these are frustrated by the Survey and Manage Standards and Guidelines.

Figure 1-1. Range of the Northern Spotted Owl.



The Purposes

Meet Terms of the Settlement Agreement

In response to a lawsuit against the Secretaries of Agriculture and Interior concerning the 2001 *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, the Secretaries, on September 30, 2002, entered into a settlement agreement with the plaintiffs, Douglas Timber Operators, Inc., and American Forest Resource Council (Douglas Timber Operators, et al. v. Secretary of Agriculture, et al., Civil No. 01-6378-AA (D. Oregon, filing December 24, 2001)). The settlement agreement requires the Agencies to examine, in an SEIS, an alternative "that replaces the Survey and Manage mitigation requirements with existing Forest Service and BLM special status species programs to achieve the goals of the Northwest Forest Plan through a more streamlined process…"

A purpose is to comply with the terms of the Settlement Agreement by considering, in detail, an alternative that eliminates the Survey and Manage Standards and Guidelines. Other elements of the Northwest Forest Plan and the Agencies' existing Special Status Species Programs would be relied on to provide for species viability and diversity while achieving other objectives of the Northwest Forest Plan.

Conserve Rare and Little Known Species

It has been longstanding policy in both the Forest Service and BLM to avoid taking actions that would lead to the listing of species under the Endangered Species Act. Policies to this effect are found in U.S. Department of Agriculture Regulation 9500-4, Forest Service Manual 2670.32, and BLM Manual 6840.22. These policies share two principles: assist in the recovery of threatened and endangered species and implement management practices to ensure that species do not become threatened or endangered because of federal actions. In addition, the Forest Service has regulations that require it "to provide for diversity of plant and animal communities based on the suitability and capability of the specific land area" (16 U.S.C. 1604(g)(3)(B)). The National Forest Management Act (NFMA) implementing regulations for the Forest Service at 36 CFR 219.19 (1982) require that "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area."

A purpose is to continue to provide for diversity of plant and animal communities in accordance with the National Forest Management Act and conserve rare and little known species that may be at risk of becoming listed under the Endangered Species Act.

Reduce Cost and Effort

Agency funding is important to accomplishing overall management objectives. Pre-disturbance surveys, strategic surveys, and other elements of the Survey and Manage Standards and Guidelines are expensive and use a disproportionate share of available agency funding. The annual cost of the Survey and Manage Program is estimated to be over $25 million. Required pre-disturbance surveys can delay projects for 2 years and draw valuable personnel and resources away from other conservation efforts. Some Survey and Manage processes including the annual species review, developing and approving management recommendations, and project exceptions are complex and time consuming, leading to substantial delays and stalled projects. These problems limit the Agencies' ability to meet policy objectives and divert money from other work including watershed restoration projects, fuel reduction projects, timber management projects, and projects designed to improve habitat for threatened, endangered, and other species.

A purpose is to reduce the Agencies' cost, time, and effort associated with rare and little known species conservation.

Healthy Forests and Timber Outputs

Some Survey and Manage species are so numerous or widespread that the acreage needed to protect them far exceeds that projected in previous analyses. As a result, some project areas become dotted with dozens of known sites, severely reducing project size or making the entire project infeasible. This problem has limited the Agencies' ability to restore forest health including thinning in Late-Successional Reserves and Riparian Reserves, and fuel treatments to reduce the threat of catastrophic wildfire to watersheds and communities at risk. This problem has also contributed to the Agencies' inability to achieve predictable and sustainable levels of timber outputs as predicted in the Northwest Forest Plan.

A purpose is to restore the Agencies' ability to achieve resource management goals that were established under the Northwest Forest Plan.

Reasons for the Purpose and Need

1. Effects of Survey and Manage were underestimated. The Survey and Manage Final SEIS in 2000 stated:

> *"A 6 MMBF reduction in PSQ [probable sale quantity] was made for 1993 known sites, but the possibility of future sites was summarized as: '... other modifications made to Alternative 9 add to the uncertainty of the PSQ calculations. These changes include the requirement to survey and manage future sites of some late-successional forest associated species,…' (USDA, USDI 1994a, page 3&4-267.) The Northwest Forest Plan SEIS made no PSQ adjustment for Survey and Manage sites that would be identified in the future. It was assumed that occurrences of these species would be rare and effects on lands available for harvest would be minimal."* (USDA, USDI 2000a.)

The Survey and Manage Final SEIS 2000 estimated that Probable Sale Quantity (PSQ) would be reduced by 51 million board feet (MMBF) per year due to implementation of the Survey and Manage Standards and Guidelines, and notes proportionate limitations on habitat restoration, prescribed fire, and other forest management activities. With further implementation experience and new information gained over the last 2 years, effects of the Survey and Manage mitigation measure are estimated to be more than twice that projected in the 2000 Final SEIS (Chapter 3&4, Timber Harvest section).

Catastrophic wildfire continues to pose risks to many communities with more than 7 million acres burned nationally in 2002. The Biscuit fire in southwest Oregon and northwest California consumed nearly 500,000 acres alone. Efforts to reduce catastrophic wildfire risk are projected to fall short of annual goals by 20 percent due to conflicts with the Survey and Manage Standards and Guidelines (Chapter 3&4 Wildland and Prescribed Fire section). Identifying a single, mid-slope site for a Survey and Manage species can prevent fuel treatment in an entire prescribed burning unit.

The Survey and Manage Standards and Guidelines have clearly not had the relatively minor effects originally predicted. Many of the Survey and Manage species are so numerous that the required avoidance substantially constrains other forest management activities including fuel reduction treatments, watershed and late-successional forest restoration, and timber harvests. Pre-disturbance (clearance) surveys are required for 69 Survey and Manage species prior to undertaking habitat-disturbing activities. When a species is located during surveys, a "known site" is established and managed. Management usually includes a buffer ranging from 1/4 to 10

acres in size. For one species, 600 acres are managed for each site found. For another, so many sites are found in project areas that whole projects are cancelled. This has reduced silvicultural treatments designed to enhance old-growth development in Late-Successional Reserves and prevented the implementation of fuel treatments in areas at high risk of catastrophic wildfire. Currently, the Agencies manage more than 26,000 acres of known sites, typically to the exclusion of other forest management activities, regardless of the number of known sites nearby.

2. Survey and Manage is costly and time consuming. The Survey and Manage Standards and Guidelines drain agency resources and impact project implementation. Annual cost is projected to be more than $25 million, while requirements for pre-disturbance surveys can extend project planning 1 to 2 additional years, delaying needed restoration or other work. Sixty-nine Survey and Manage species require pre-disturbance surveys and few habitat-disturbing activities are exempt. These factors reduce the Agencies' ability to complete restoration work, develop or expand recreation sites, prepare timber sales, or otherwise respond to management needs.

The various Survey and Manage administrative processes and procedures, originally intended to provide consistency of implementation, have turned out to be so costly and time consuming that little of the intended implementation flexibility can actually be used. Survey and Manage Standards and Guidelines generally require retention of all known sites regardless of local situations or resource objectives. For example, fuel reduction projects reintroducing fire at the landscape scale have become nearly impossible because of the requirement to protect sites even when the species occupying the site naturally occurs in fire-adapted ecosystems.

In some ways, protection measures for Survey and Manage species are more restrictive than those for federally listed threatened or endangered species. The Endangered Species Act includes provisions for authorizing incidental "take" when there is no jeopardy to the continued existence of the species. Take is authorized by regulatory agencies based on reasonable assumptions and consideration of conflicting resource management objectives. However, getting authorization to impact a Survey and Manage species requires a complicated review and approval process that can delay or stifle projects long after incidental take was authorized for threatened or endangered species in the same project area.

The amendments to the Survey and Manage mitigation measure in the 2001 Record of Decision significantly reduced costs and conflicts when compared with what the Agencies would have experienced under full implementation of the original 1994 Northwest Forest Plan Survey and Manage Standards and Guidelines. However, even as amended, the complexity and cost of the Survey and Manage mitigation measure is disproportionately reducing agency resources that would otherwise be available for implementation of other elements of the Northwest Forest Plan.

3. Species protections under the Northwest Forest Plan may have exceeded legal requirements causing other programs and activities to suffer. The Forest Service' NFMA implementing regulation at 36 CFR 219.19 (1982) requires that "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." The FEMAT, in crafting the ten alternatives considered in the 1994 SEIS was instructed to "include alternatives that range from a medium to a very high probability of ensuring the viability of species" (USDA et al. 1993, p. II-5). In addition, the Survey and Manage mitigation measure was added well after the ten alternatives were developed and analyzed. The screens that identified species to be included in the Survey and Manage mitigation measure did "not represent a judgment about what is required by the National Forest Management Act or the Endangered Species Act" (USDA, USDI 1994a, p. J2-2); therefore, inclusion in Survey and Manage does not mean species viability is dependent upon this mitigation measure.

The BLM planning regulations, issued under the Federal Land Policy and Management Act (FLPMA) (43 U.S.C.1701), have no diversity or viability requirements. They only require multiple use. Similarly, the Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act (43 U.S.C. 1181a) contains no provisions for species diversity or viability. Yet, under Option 9, BLM administered lands were given the same species viability protections as National Forest

System lands (USDA et al. 1993, p. II-5). Extending the viability requirements to BLM lands may have exceeded BLM's legal obligation for species protection.

The Northwest Forest Plan states: "By its own terms, the [Forest Service viability provision] regulation applies only to vertebrate species. Nonetheless, consistent with the statutory goals of providing for diversity of plant and animal communities and the long-term health of federal forests, as well as the agencies' conservation policies, our decision satisfies a similar standard with respect to non-vertebrate species to the extent practicable" (USDA, USDI 1994b, p. 44). Again, legal requirements for species protection may have been exceeded.

Finally, the "persistence objective" in the 2000 Survey and Manage Final SEIS, was defined not as a legal threshold, but as "providing for roughly the same likelihood of persistence as that which was provided by the Northwest Forest Plan as originally adopted in the 1994 ROD" (USDA, USDI 2000a, p. 42). However, both the 1994 Northwest Forest Plan Final SEIS and Record of Decision describe the achieved level as exceeding, and not required by, applicable laws and regulations (USDA, USDI 1994a, p. J2-2, and USDA, USDI 1994b, p. 44). Legal requirements were exceeded, in part, because it was believed that costs associated with the Survey and Manage mitigation measure and conflicts with management objectives were low.

In summary, while agencies are not prohibited from exceeding these laws, by doing so, species protection measures have unnecessarily constrained other programs and activities.

4. Special Status Species Programs should suffice. Rare and uncommon species in all other parts of the nation rely on the Agencies' Special Status Species Programs to meet legal and policy requirements. These programs have successfully accomplished objectives similar to those of the Survey and Manage Standards and Guidelines with lower costs and fewer program conflicts.

Proposed Action

The Proposal

The Agencies propose to amend 28 land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines.

Separate from this proposal, the Agencies reviewed the 304 Survey and Manage species to determine their eligibility for inclusion in the Agencies' existing Special Status Species Programs. It is anticipated that Survey and Manage species that are eligible for the Agencies' Special Status Species Programs will be added to those programs if the Survey and Manage Standards and Guidelines are removed. The Agencies' Special Status Species Programs seek to further the objectives of the Endangered Species Act by preventing future listings of species as threatened or endangered. Both programs require coordination with state agencies to achieve conservation goals of species identified by state governments (see Chapter 2 for description of Special Status Species Programs). The objectives of the Forest Service' program also include compliance with NFMA regulations requiring diversity of plant and animal communities.

Not all of the 304 rare or little known species (and 4 arthropod guilds) are eligible for the Agencies' Special Status Species Programs. Tentatively, the Agencies determined 130 of the 304 Survey and Manage species are eligible for one or more of the programs. In making the tentative determination, the Agencies used global and state biodiversity database rankings from the Oregon Natural Heritage Program (ONHP) along with existing agency policy. ONHP rankings and criteria for inclusion in the Agencies' Special Status Species Programs are not based solely on local abundance; they also consider habitat distribution, threats, global population levels, and other factors. None of the species affected by this proposal are currently listed as threatened or endangered or proposed for listing under the Endangered Species Act. The proposed action does

not include any other changes to the Northwest Forest Plan. The proposed action is described in detail in Chapter 2.

Decision to be Made

The decision to be made is whether to select the proposed action or another alternative. The decision will be based on the degree to which the proposed action and alternatives meet the purpose and need. Specifically, alternatives will be evaluated on how well they conserve rare or little known species, reduce costs, and achieve the resource management objectives of the Northwest Forest Plan including healthy forests and timber outputs. While the settlement agreement provides an impetus to prepare this SEIS, it does not provide a basis for selecting an alternative.

This SEIS is a supplement to the 2000 Survey and Manage Final SEIS, which was a supplement to the Northwest Forest Plan Final SEIS. The Agencies have chosen to focus this proposal on problems associated with the Survey and Manage Standards and Guidelines. Separate from this action, the Agencies have recognized a need to " … make the Aquatic Conservation Strategy (ACS) in the [1994] Record of Decision consistent with the original intent of the report prepared by the Forest Ecosystem Management Assessment Team …" (67 FR 70575, November 25, 2002) and have chosen to do that in a separate SEIS.

Scoping

A Notice of Intent to prepare the SEIS was published in the Federal Register on October 21, 2002 (67 FR 64601). The Notice of Intent provided preliminary information about the proposed action and invited public comment. Concurrently, a scoping letter was mailed to more than 3,300 individuals and groups identified as potentially interested in the proposed action and analysis. The Agencies received more than 650 letters in response to the Notice of Intent and the scoping letter. Public comments contained a wide variety of suggestions for issues and alternatives. Alternative 3 was developed in response to scoping comments suggesting ways to cut costs and achieve resource objectives by making changes to the Survey and Manage Standards and Guidelines. Chapter 2 of this SEIS includes a discussion of other alternatives that were considered, but eliminated from detailed study and explains why they were eliminated. Many issues raised during scoping are relevant to this analysis and are addressed in Chapter 3&4. Other issues were raised that are not pertinent to this analysis. For example, some comments suggested ending all commercial logging everywhere in the Northwest while another was concerned about the inadequacies of city planning rules intended to protect the environment. These issues have not been considered further.

Some comments suggested that all old-growth forests need to be protected and placed off-limits to logging. They suggested that protecting all remaining late-successional and old-growth forests on federally managed lands would meet the purpose and need. Protecting additional old-growth forests outside the Late-Successional and Riparian Reserves would be akin to changing land allocations by creating additional Late-Successional Reserves. Various levels of reserves, including one which protected all remaining old-growth stands, were a key element in designing the ten alternatives originally considered for the Northwest Forest Plan, the SEIS this SEIS supplements.

Some comments suggested eliminating the Survey and Manage mitigation measure would lead to Survey and Manage species being listed as threatened or endangered. Others were concerned that eliminating the Survey and Manage mitigation measure could lead to loss of old-growth forests, unraveling of ecological systems, and loss of social values. Other commenters provided different viewpoints and suggested eliminating the Survey and Manage mitigation measure was needed so that fuel reduction, thinning, and other restoration treatments could proceed without further delays.

Preferred Alternative

Based on consideration of the environmental consequences, Alternative 2, with the mitigation described in Chapter 3&4, was found to best meet the purpose and need, and is the preferred alternative.

Chapter 2 - The Alternatives

Introduction

This chapter presents three alternatives including the Proposed Action. Alternative 1 is the No-Action Alternative and would retain the Survey and Manage Standards and Guidelines. Under Alternative 2, the Proposed Action, the Agencies propose to amend 28 land and resource management plans within the range of the northern spotted owl by removing the Survey and Manage Standards and Guidelines. Alternative 3 was developed in response to comments received during scoping suggesting that the purpose and need would be better met by alternatives other than the proposed action. Alternative 3 is similar to the proposed action except the Agencies would amend 28 land and resource management plans by modifying the Survey and Manage Standards and Guidelines. These modifications include: (1) removing provisions for uncommon species; (2) eliminating the requirement to conduct pre-disturbance surveys in non-late-successional and non-old-growth forest stands; (3) changing the review process for excepting known sites from management; and, (4) changing the review process for excepting pre-disturbance survey requirements for Wildland Fire for Resource Benefits. All alternatives apply to lands administered by the Forest Service and BLM within the Northwest Forest Plan area. Alternatives 2 and 3 are hereafter referred to collectively as the action alternatives.

The Northwest Forest Plan, adopted in 1994 and amended in 2001, amended land and resource management plans on all administrative units of the Forest Service and BLM in western Washington, western Oregon, and northwestern California. The Northwest Forest Plan provides substantial direction for managing habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. The Survey and Manage Standards and Guidelines proposed for removal in the Proposed Action were added to the Northwest Forest Plan as a mitigation measure for species that were rare or about which little was known.

References to the Northwest Forest Plan in this SEIS are intended as references to those portions of individual land and resource management plans that were amended by the 1994 and/or 2001 Records of Decision. The land and resource management plans are those for each of the Forest Service and BLM administrative units in the Pacific Northwest and northwestern California within the range of the northern spotted owl (Figure 1-1).

Background for Survey and Manage Standards and Guidelines

The Northwest Forest Plan

In the late 1980's and early 1990's, conflicts between protecting late-successional and old-growth forest related species habitats and providing a predictable and sustainable level of timber harvest and other forest management activities brought many Forest Service and BLM forest management activities to an impasse. At a 1-day forest conference in April 1993, then President Clinton directed the Agencies to prepare a plan that would balance an appropriate level of protection for wildlife, forest health, and waterways, with the human and economic dimensions dependent on timber sales.

The Northwest Forest Plan resulting from this charge was adopted in April 1994, and applies to Forest Service and BLM-administered lands in western Washington, western Oregon, and northwestern California. The Northwest Forest Plan has the dual purpose of providing for management of habitat for late-successional and old-growth forest related species while providing for a predictable and sustainable level of timber harvest.

The Northwest Forest Plan primarily takes a landscape approach to managing species associated with late-successional and old-growth forests. Of the 24.5 million federally-managed acres within the Northwest Forest Plan area, almost 20 million acres either provide for old-growth and late-successional forest conditions under designation of Congressionally Reserved Areas, or they are managed for such conditions in Late-Successional Reserves, Managed Late-Successional Areas, Administratively Withdrawn Areas, or Riparian Reserves. The remaining 4.5 million acres are allocated to Matrix or Adaptive Management Areas where the bulk of timber outputs are produced.

The Northwest Forest Plan was based on the Forest Ecosystem Management Assessment Team (FEMAT) report. The FEMAT was chartered in April 1993 by former President Clinton to write a scientifically based plan for "protecting the long-term health of our forests, our wildlife, and our waterways...in balance with...a predictable and sustainable level of timber sales and non-timber resources..." within the range of the northern spotted owl (USDA, USDI 1994a, p. 1-4). In addition to a no-action option, the FEMAT developed nine options for meeting this charge. The nine options served as the basis for the alternatives presented in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a).

The Survey and Manage Standards and Guidelines

The FEMAT assembled panels of experts to assess the likelihood of meeting various population stability and distribution outcomes for 1,120 species for 7 of their 10 options, including Option 9, the basis for the Northwest Forest Plan (USDA et al. 1993, pp. IV-40 through IV-49, IV-77, and IV-185). The panels used an outcome-based scale to assess the likelihood that habitat would support populations of these species. Although the majority of these species, including the northern spotted owl and all other threatened or endangered species, rated well, the panels could not confidently say that Option 9 would provide for stabilized, well-distributed populations for 100 years across federally managed lands for some of the lichens, bryophytes, fungi, arthropods, mollusks, and other species. FEMAT (USDA et al. 1993, p. II-34) reported:

> *"[t]he lack of information on the species and their responses to habitat manipulations coupled with the large proportion that are inherently rare and/or locally endemic and likely sensitive to habitat disturbance gave the expert panels and our Team little confidence to predict many species/groups would find habitat well distributed within the range of the northern spotted owl for the next 100 years. These results are troubling."*

Option 9 was identified as the preferred alternative in the Northwest Forest Plan Draft SEIS published for public comment in July 1993. In this option, approximately 80 percent of the federally managed lands in the Northwest Forest Plan area were allocated to reserves. Late in the analysis process, in response to concerns about the above species, the SEIS team formed a scientist-staffed "Additional Species Analysis Team" to reconsider these species and suggest mitigation measures (USDA, USDI 1994a, Appendix J2). This team selected species for additional analysis based on: (1) species ratings in the FEMAT report; (2) expected changes in Alternative 9 after the Northwest Forest Plan Draft SEIS; (3) cumulative effects on species; and, (4) additional species-specific criteria (USDA, USDI 1994a, pp. J2-2 through J2-3). Through this screening process, the team identified 486 species and 4 arthropod guilds for additional analysis.

Following their analysis, the team described 23 possible mitigation measures to reduce species concerns. None of these mitigation measures, including the eight eventually adopted, resolved the issues of persistence or extirpation for most of these species, and overall species ratings were

not recalculated. Although these mitigation measures reduced the likelihood species would be disturbed by management activities, they are only a part of the overall strategy of the Northwest Forest Plan to meet species management objectives. The Northwest Forest Plan network of reserves and other designated areas, along with many other standards and guidelines, work together to provide habitat and protect species. The Survey and Manage mitigation measure was among the eight mitigation measures adopted, from the additional species analysis, in the final version of the Northwest Forest Plan (USDA, USDI 1994b, pp. C-4 through C-6 and Table C-3). Species were assigned to the Survey and Manage mitigation measure to increase the likelihood of a stable, well-distributed population of the species across federally managed lands or to decrease the likelihood of their extirpation on federally managed lands in the Northwest Forest Plan area.

The late addition of the Survey and Manage mitigation measure to the Northwest Forest Plan SEIS precluded a detailed effects analysis. For example, the Survey and Manage mitigation measure was predicted to have a "relatively minor" effect on maintaining a functional and interconnected late-successional forest ecosystem. Other effects were "likely to improve at least slightly" when compared to effects without the eight mitigation measures (USDA, USDI 1994a, p. 3&4-39). Similarly, except for a 6 million board foot (MMBF) reduction in Probable Sale Quantity (PSQ) to reflect management of Survey and Manage sites known at that time, the Northwest Forest Plan Final SEIS did not quantify socioeconomic effects of these mitigation measures, noting only that these measures "... add to the uncertainty of PSQ calculations" (USDA, USDI 1994a, p. 3&4-267). The Final SEIS provided only a rough estimate for some species, and no estimate at all for others, of the overall acreage involved in managing known sites for Survey and Manage species (USDA, USDI 1994a, p. J2-40 and others).

The Survey and Manage Standards and Guidelines were developed for 23 bryophytes (mosses and liverworts), 234 fungi, 81 lichens, 58 mollusks (snails and slugs), 5 amphibians (salamanders), 17 vascular plants (plants with stems), 1 mammal (red tree vole), and 4 arthropod guilds (insects and related species). Species were assigned to one or more of the following four categories: (1) manage known sites where species are located; (2) survey prior to potential habitat-disturbing activities; (3) conduct extensive surveys; and, (4) conduct general regional surveys to find additional locations and learn more about the species and its habitat.

The Agencies have made changes to the Survey and Manage mitigation measure since it was first adopted in 1994. Changes were made in species assignments in 1995 and 1996, primarily to correct errors in the original category assignments. The Agencies also changed the implementation date for pre-disturbance surveys for 32 species in February 1999, and again for 7 of these same species in February 2000.

The 2000 Survey and Manage SEIS

By 1998, the Agencies had sufficient experience implementing the Survey and Manage Standards and Guidelines to conclude the requirements were not clear, efficient, or practicable. An SEIS to assess alternative ways to correct these problems was begun in November 1998. The SEIS considered alternatives with an objective of continuing to provide the same level of protection intended by the 1994 Record of Decision.

In January 2001, the Agencies issued a Record of Decision, based on the Survey and Manage Final SEIS 2000, which amended the Survey and Manage Standards and Guidelines to: (1) clarify required management; (2) remove unnecessary and duplicative or conflicting requirements; (3) add a process for changing species between categories; and, (4) add a process for adding or removing species from Survey and Manage, based on new information. Species would be removed when they fail to meet the three basic criteria for Survey and Manage: (1) does the species have suitable habitat in the Northwest Forest Plan area? (2) is the species associated with late-successional or old-growth forest? and, (3) does the reserve system and other standards and guidelines provide for a reasonable assurance of species persistence? The Survey and Manage Final SEIS 2000, Record of Decision, and Standards and Guidelines are on the internet at http://www.or.blm.gov/nwfpnepa/.

The 2001 Record of Decision led to removal of 72 (of more than 400) species from Survey and Manage in all or part of their range. An additional 21 species were removed in June 2002 under the annual species review process established in the 2001 Record of Decision, and 8 more species were removed in March 2003. For those species removed because they were not associated with late-successional or old-growth forests, their known sites continue to be managed until the Agencies decide whether to add them to the Special Status Species Programs. There are currently 304 species and 4 arthropod guilds included in the Survey and Manage mitigation measure with management requirements for each species based on characteristics of relative rarity and whether they can be reasonably located and identified during site-specific field surveys.

For 69 species, Survey and Manage requires site-specific "pre-disturbance" surveys prior to most management activities. In addition, "strategic" surveys are required for all Survey and Manage species to learn more about the species and its habitat. Strategic surveys gather needed information on species for which pre-disturbance surveys are not practical. Information gathered through strategic surveys provides the basis for making species management decisions.

When surveys locate a species, a "known site" is established and is managed. These sites normally range from 1/4 to 10 acres in size. To date there are nearly 40,000 records of species sightings and known sites. However, for about two-thirds of the species, each has been found on fewer than 20 sites. Only 9 species have been found on more than 200 sites.

The current Survey and Manage Standards and Guidelines are summarized under Alternative 1 (No-Action) later in this chapter. The current Survey and Manage Standards and Guidelines, Sections I through VIII and XII are included in Appendix 1.

The Lawsuit and Settlement Agreement

On December 26, 2001, the Douglas Timber Operators, Inc., an Oregon corporation, and American Forest Resource Council, an Oregon Corporation, filed a complaint against the Secretary of Agriculture and the Secretary of Interior in the United States District Court for the District of Oregon (Douglas Timber Operators, et al. v. Secretary of Agriculture, et al., Civil No. 01-6378-AA (D. Oregon). The complaint alleged that the January 2001 amendment to the Survey and Manage Standards and Guidelines "…transferred more than 81,000 acres of timber-producing NWFP forest land into permanent reserves, resulting in a 7% reduction on the regional timber volume permitted under the NWFP - a loss of 51 million board feet (MMBF) of timber sales per year in perpetuity" and "added uncertainty." The complaint also alleged that the 2001 Survey and Manage amendment is "…in violation of substantive and procedural requirements of the Oregon and California and Coos Bay Wagon Road Grant Lands Act (O&C Act), 43 U.S.C. § 1181a, the National Forest Management Act (NFMA), 16 U.S.C. §§ 1600, et seq., the Multiple-Use Sustained-Yield (MUSY) Act of 1960, 16 U.S.C § 528-531, and the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. §§ 1701, et seq." The Association of O&C Counties intervened on behalf of plaintiffs and filed an Intervenor's Complaint substantially similar to the Douglas Timber Operators, et al., amended complaint. The Secretaries filed an answer denying all allegations.

On September 30, 2002, "to avoid further costly litigation, and without admission of any liability or wrongdoing by either party," the parties signed a Settlement Agreement. They agreed the BLM and Forest Service would supplement the Survey and Manage Final SEIS 2000 by "considering an alternative that replaces the Survey and Manage mitigation requirements with existing Forest Service and BLM special status species programs to achieve the goals of the Northwest Forest Plan through a more streamlined process." Douglas Timber Operators, Inc., and American Forest Resource Council agreed to stay their complaint until July 28, 2003, or the issuance of the Record of Decision, whichever comes first, and agreed to dismiss their previous complaint and seek no reimbursement for related legal fees when the Record of Decision is issued.

Preparing this SEIS and the associated Record of Decision will fully meet the Secretaries' commitment under the Settlement Agreement.

This Supplemental Environmental Impact Statement

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) direct that agencies supplement an environmental impact statement:

> *"... if the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts" (40 CFR 1502.9(c)(1)(i) and (ii)).*

In this case, the Settlement Agreement directs the agencies to consider "…an alternative that replaces the Survey and Manage mitigation measure with existing Forest Service and BLM special status species programs." This constitutes a significant new circumstance that warrants preparation of a supplemental environmental impact statement. Because the proposal is not an action separate and distinct from the Northwest Forest Plan and the land and resource management plans of the Agencies, a new EIS is not warranted. Therefore, it is appropriate to analyze the effects of this proposal in an SEIS to the Final SEIS for Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines; the Northwest Forest Plan Final SEIS; and the Final EISs for the BLM and Forest Service land and resource management plans referenced in the Northwest Forest Plan or prepared subsequent to it.

The analysis in this SEIS relies heavily on the analysis in the Northwest Forest Plan Final SEIS and the Final SEIS for Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, and, to a lesser extent, on the EISs prepared for the land and resource management plans of the Agencies. Such data and analyses are incorporated in this SEIS by reference (per 40 CFR 1502.21) to the extent they continue to be relevant to, and are not superseded by, the contents of this SEIS. As described above and in more detail later in this chapter, selecting one of the action alternatives would result in amending the Agencies' land and resource management plans that either incorporate or were amended by the 1994 and 2001 Records of Decision.

Changing Standards and Guidelines

The Northwest Forest Plan Standards and Guidelines specify that "decisions to change ...[these] standards and guidelines will be made only through the adoption, revision, or amendment of these documents following appropriate public participation, NEPA procedures, and coordination with the Regional Interagency Executive Committee" and "the amendments will be reviewed by the Regional Interagency Executive Committee to assure consistency with the objectives of these standards and guidelines" (USDA, USDI 1994b, p. E-18). The alternative proposed for selection for this SEIS will be submitted to the Regional Interagency Executive Committee (RIEC) for review prior to finalizing the Record of Decision.

The Planning Area

The planning area for this SEIS is the federally administered land within the Northwest Forest Plan area, which corresponds to the range of the northern spotted owl as defined in 1994 (see Figure 1-1). These lands are located in western Washington, western Oregon, and northwestern California.

Although all federal lands within the Northwest Forest Plan area are included in the analysis and are considered to contribute habitat for late-successional and old-growth forest related species, including species affected by Survey and Manage, the management direction addressed in this SEIS applies only to those lands managed by the Forest Service, BLM, and 5,400 acres managed by the Coquille Tribe. No management direction is included here for other federally managed lands, other Native American trust lands, or state and private lands. However, cumulative impacts from expected management activities on these other lands, as appropriate, were considered as part of the effects analysis in this SEIS.

Relationship of Alternatives to Existing Management Plans

If one of the action alternatives is selected, the direction established by the Record of Decision for this SEIS will remove all or part of the Survey and Manage Standards and Guidelines in all land and resource management plans for Forest Service and BLM administrative units within the Northwest Forest Plan area.

The Coquille Indian Tribe currently manages approximately 5,400 acres of forest lands (Coquille Forest) under the same standards and guidelines as the adjacent federal land management agency (Coos Bay District, BLM). By amending the land and resource management plans for the BLM Coos Bay District, the action alternatives would, in effect, also remove all or part of the Survey and Manage Standards and Guidelines from 5,400 acres of tribal trust lands owned by the Coquille Indian Tribe. The Coquille Tribe is in a unique situation because it is the only tribe in the Northwest Forest Plan area that must comply with Northwest Forest Plan Standards and Guidelines.

Bureau of Land Management

Adoption of one of the action alternatives would be consistent with 43 CFR 1610.5-5 and would amend the resource management plans for the Coos Bay, Eugene, Medford, Roseburg, and Salem districts in Oregon; the Klamath Falls Resource Area of the Lakeview District, also in Oregon; and the Arcata, Redding, and Ukiah field offices in California. The King Range National Conservation Area Management Plan in the Arcata Field Office would also be amended. Because the action alternatives would modify only a small portion of each of these resource management plans, plan revisions would not be necessary (43 CFR 1610.5-6).

When a decision is made to prepare an environmental impact statement, the amending process follows the same procedure required for preparation and approval of the plan (43 CFR 1610); consideration is limited to that portion of the plan being considered for amendment. The BLM resource management planning process includes nine steps. The planning steps that pertain to this SEIS include issue identification, data collection, formulation of alternatives, estimation of effects, selection of the preferred alternative, and selection of the proposed plan amendment. If several plans are being amended simultaneously, a single environmental impact statement may be prepared to cover all amendments (43 CFR 1610.5-5).

Forest Service

Adoption of one of the action alternatives would result in amendment of the National Forest land and resource management plans for the Gifford Pinchot, Mt. Baker-Snoqualmie, Okanogan, Olympic, and Wenatchee National Forests in Washington and the Deschutes, Mt. Hood, Rogue River, Siskiyou, Siuslaw, Umpqua, Willamette, and Winema National Forests in Oregon, in Region

6; and the Klamath, Lassen, Mendocino, Modoc, Shasta-Trinity, and Six Rivers National Forests in California in Region 5.

If an amendment to a Forest Plan results in "a significant change in the plan," the NFMA and its 1982 implementing regulations under which this SEIS is prepared, require that the amendment process follow the procedures used in the initial development of the plan. If the proposed change in the plan is not significant, public notification and completion of the NEPA procedures are still required (16 USC 1604 (f)(4) and 36 CFR 219.10(f)). Determining whether a plan amendment is a significant change uses different criteria than those used in evaluating significance in the NEPA process. For the NFMA requirement, the Forest Service Manual (FSM 1922.51 and .52) provides specific direction.

FSM 1922.51 - Changes to the Forest Plan that are Not Significant. Changes to the forest plan that are not significant can result from:

> *1. Actions that do not significantly alter the multiple-use goals and objectives for the long-term land and resource management.*

The actions proposed in these alternatives would not alter the objectives and the multiple-use goals of the land and resource management plans as amended by the Northwest Forest Plan. The purpose of the action alternatives is to facilitate the achievement of those goals and objectives. The action alternatives will continue to provide species protection in compliance with all applicable laws and regulations, while making more Agency resources available for other forest management priorities, and simplifying processes so needed management actions can move forward more expeditiously. The underlying need to which the action alternatives are responding is the need for achievement of the objectives originally established for the Northwest Forest Plan, to the extent these objectives are frustrated by the Survey and Manage Standards and Guidelines.

> *2. Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management.*

The action alternatives would change management on a portion of sites occupied by rare and uncommon species. The action alternatives would not reduce species protection below legally required levels or increase timber harvest beyond levels identified in the Northwest Forest Plan Final SEIS. The action alternatives would reduce costs and improve the Forest Service' ability to conduct forest management activities at a level described in the land and resource management plans. Selection of one of the action alternatives would enable the Forest Service to better meet the long-term goals and objectives currently identified in land and resource management plans.

> *3. Minor changes in standards and guidelines.*

The action alternatives would remove all or part of a mitigation measure added during preparation of the Northwest Forest Plan Final SEIS. The action alternatives would not significantly change any key elements of the underlying strategy or standards and guidelines. Removal of all or part the Survey and Manage Standards and Guidelines would be a relatively minor change because: (1) the Northwest Forest Plan is an ecosystem-based approach that relies primarily on a system of reserves and standards and guidelines to accomplish its primary objectives; (2) the underlying land and resource management plans also provide habitat for the affected species; and, (3) Survey and Manage species that qualify would probably be given Sensitive Species status. The effects discussion in Chapter 3&4 helps quantify the change within the context of the Northwest Forest Plan.

4. Opportunities for additional management practices that will contribute to achievement of the management prescription.

The action alternatives are specifically designed to better and more efficiently meet the underlying needs identified in the Northwest Forest Plan Final SEIS.

FSM 1922.52 - Changes to the Forest Plan that are Significant. The following examples are indicative of circumstances that may cause a significant change to a forest plan.

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (36 CFR 219.10(e)).

The changes proposed by the action alternatives would help achieve, not alter, the relationship between the levels of multiple-use goods and services originally projected. Species currently included in the Survey and Manage mitigation measure will continue to receive protection as required to meet all applicable laws and regulations.

2. Changes that may have an important effect on the entire forest plan or affect land and resources throughout a large portion of the planning area during the planning period.

The changes proposed would remove all or part of a mitigation measure added late in the preparation of the Northwest Forest Plan. The action alternatives do not change land allocations or other elements of the Northwest Forest Plan. There will be a reduction in the area managed as known species sites; however, no other Northwest Forest Plan resource objective is dependent upon those sites. There is predicted to be an increase in timber harvest from current levels; but the current levels are well below the predictions originally displayed in the Northwest Forest Plan Final SEIS. The purpose of the proposal is to achieve levels of timber harvest that were expected when the Northwest Forest Plan was established in 1994. Thus, the action alternatives will help achieve (and not change) the multiple-use goals and objectives set forth in the Northwest Forest Plan Record of Decision.

The Alternatives

Overview

The following section describes the alternatives in detail. Under Alternative 1, the No-Action Alternative, implementation of all current elements of the Northwest Forest Plan would continue including the Survey and Manage mitigation measure, the underlying land and resource management plans, and relevant agency programs and policies. Under Alternative 2, the Proposed Action, the Agencies propose to amend 28 land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines. Under Alternative 3, the Agencies would amend 28 land and resource management plans to modify the Survey and Manage Standards and Guidelines by: (1) removing provisions for uncommon species; (2) eliminating the requirement to conduct pre-disturbance surveys in non-late-successional and non-old-growth forest stands; (3) changing the review process for excepting known sites from management; and, (4) changing the review process for excepting pre-disturbance survey requirements for Wildland Fire for Resource Benefits.

Separate from this proposal, the Agencies reviewed the 304 Survey and Manage species to determine their eligibility for inclusion in the Agencies' existing Special Status Species Programs. It is anticipated that Survey and Manage species that are eligible for the Agencies' Special Status Species Programs will be added to those programs if the Survey and Manage Standards and Guidelines are removed. Under Alternative 2, 130 of the 304 Survey and Manage species plus 4 arthropod guilds would be eligible for inclusion in one or more of the Agencies' existing Special

Status Species Programs. Under Alternative 3, 26 Survey and Manage species plus 4 arthropod guilds would be removed from the Survey and Manage Standards and Guidelines and 9 would be eligible for inclusion in one or more of the Agencies' existing Special Status Species Programs.

The Agencies update their Special Status Species lists on a regular schedule, when state heritage programs publish new rankings, or when other information indicates a need. Both Forest Service regions delayed or deferred inclusion of additional species in their Sensitive Species programs because the species were already included in the Survey and Manage mitigation measure. With the proposed removal of the Survey and Manage Standards and Guidelines under the Proposed Action, and with new information about Survey and Manage species as a result of recent pre-disturbance and strategic surveys, the Agencies requested updated rankings from state heritage programs. From this and other species information, each agency determined what additional species should be added to the Special Status Species Programs in the absence of the Survey and Manage mitigation measure. The Agencies believe this is consistent with the Settlement Agreement language requiring "…considering an alternative that replaces the Survey and Manage mitigation requirements with existing Forest Service and BLM special status species programs to achieve the goals of the Northwest Forest Plan through a more streamlined process."

The BLM's Special Status Species program and the Forest Service' Sensitive Species program are referred to collectively in this SEIS as the Agencies' Special Status Species Programs.

Elements Common to All Alternatives

Special Status Species Programs

All alternatives include the Agencies' Special Status Species Programs. In general, these programs seek to further the objectives of the Endangered Species Act by preventing future listings of species as threatened or endangered. They are described in detail under Alternative 2 (Proposed Action). There are also several assumptions regarding these programs that are shared by all alternatives.

1. Any Survey and Manage species the Agencies have determined eligible for their Special Status Species Programs may be added to those programs at the discretion of the Agency.

2. For analysis purposes, it is assumed any species removed from Survey and Manage will be added to Agency Special Status Species Programs for which it is eligible (see Table 2-8).

3. Within the Northwest Forest Plan area, where species have been included in both Survey and Manage and an Agencies' Special Status Species Program, the species has been managed primarily under the Survey and Manage Standards and Guidelines. This is because the Survey and Manage Standards and Guidelines generally meet or exceed the requirements of the Special Status Species Programs. It is assumed this policy will continue for species that become listed in both programs under any alternative selected.

4. Species that were previously removed from Survey and Manage because they were determined not to be closely associated with late-successional or old-growth forests, will continue to have their known sites managed until the Agencies' have determined whether to add them to their Special Status Species Programs.

Legal Requirements

All alternatives meet all legal and regulatory requirements of the FLPMA, NFMA, and Endangered Species Act (ESA). Aside from the Survey and Manage mitigation measure, all alternatives retain all other elements of the Northwest Forest Plan. The alternatives include the standards and guidelines of the underlying land and resource management plans for the individual BLM and Forest Service administrative units.

Endangered Species Act Consultation

To conform to the terms of the Settlement Agreement, the BLM and Forest Service will prepare a Biological Assessment for the Final SEIS, and consult with the U.S. Fish and Wildlife Service (FWS) and/or National Marine Fisheries Service (NOAA Fisheries) to the extent required by the ESA.

Northwest Forest Plan Standards and Guidelines

The Northwest Forest Plan Standards and Guidelines were adopted in April 1994, as amendments to existing land and resource management plans, or were subsequently adopted into land and resource management plans completed since that date. The complete Northwest Forest Plan SEIS, appendices, Record of Decision, and Standards and Guidelines are available on the internet at http://www.or.blm.gov/nwfpnepa/. The Northwest Forest Plan Standards and Guidelines were amended in January 2001. The 2001 amendment, which primarily affected the Survey and Manage Standards and Guidelines, is also on the internet at http://www.or.blm.gov/nwfpnepa/ and is summarized under Alternative 1 below.

The Northwest Forest Plan divides all BLM and Forest Service managed lands within the range of the northern spotted owl (western Washington, western Oregon, and northwestern California) into specific land allocations. Each allocation comes with its own set of standards and guidelines to ensure management activities will meet plan objectives on those lands. About 80 percent of the area is designated as reserves or withdrawn areas. Table 2-1 displays how the 24.5 million acres of federally managed lands in the Northwest Forest Plan area are allocated.

Alternative 1, No-Action (Northwest Forest Plan Including Survey and Manage)

Alternative 1, the No-Action Alternative, continues implementation of all current elements of the Northwest Forest Plan including the Survey and Manage mitigation measure, the underlying land and resource management plans for the individual administrative units, and relevant agency programs and policies. Key features of the Survey and Manage Standards and Guidelines are summarized below. The current Survey and Manage Standards and Guidelines, Sections I through VIII and XII are included in Appendix 1. The January 2001 Record of Decision and the complete Survey and Manage Standards and Guidelines are available on the internet at http://www.or.blm.gov/nwfpnepa/.

Table 2-1. Northwest Forest Plan Land Allocations.

Allocation	Acres[1] (millions)
Congressionally Reserved Areas	7.3
Late-Successional Reserves and Managed Late-Successional Areas	7.4
Adaptive Management Areas	1.5
Administratively Withdrawn Areas	1.5
Riparian Reserves	2.6
Matrix	4.0

[1] Acres do not total 24.5 million because of rounding.

Program Objectives - Survey and Manage

In general, the Survey and Manage Standards and Guidelines are designed to help the Northwest Forest Plan provide for a reasonable assurance of persistence of late-successional and old-growth forest associated species. The objective is to provide roughly the same likelihood of persistence as that provided by the Northwest Forest Plan as originally adopted in the 1994 Record of Decision (USDA, USDI 2001, p. Standards and Guidelines - 3). In particular, the Northwest Forest Plan specified use of the Forest Service viability provision in the National Forest System Land and Resource Management Planning Regulation for the National Forest Management Act of 1976 (36 CFR 219.19). This viability provision requires that fish and wildlife habitat be managed to maintain viable populations of existing native and desired non-native vertebrate species. The Northwest Forest Plan Record of Decision (p. 44) identified compliance with this Forest Service regulation as a goal across both Forest Service and BLM administered lands as a means of serving the important policy goal of protecting the long-term health and sustainability of all federal forests within the range of the northern spotted owl and the species that inhabit them. For non-vertebrate species, the Northwest Forest Plan Record of Decision extended "a similar standard (to the one reflected in the NFMA viability provision for vertebrate species) … to the extent practicable" (p. 44).

Number of Species and Taxa

The Survey and Manage mitigation measure currently applies to 304 species and 4 arthropod guilds in all or part of their range. Taxa include: vertebrates, bryophytes, mollusks, vascular plants, fungi, and lichens, in addition to the 4 arthropod guilds. Each species is assigned to one of six management categories as shown on Table 2-8 at the end of this chapter.

Standards for Inclusion

Three Basic Criteria for Survey and Manage

1. *The species must occur within the Northwest Forest Plan area, or occur close to the Northwest Forest Plan area and have potentially suitable habitat within the Northwest Forest Plan area.*

2. *The species must be closely associated with late-successional or old-growth forest.*

3. *The reserve system and other standards and guidelines of the Northwest Forest Plan do not appear to provide for a reasonable assurance of species persistence.*

The Survey and Manage Standards and Guidelines have three basic criteria (see box) that must be met for a species to be included. Species no longer meeting these criteria will be removed; species meeting the criteria can be added.

Concern for persistence is one of the basic criteria for applying the Survey and Manage mitigation measure to a species. A concern for persistence exists when the reserve system and other standards and guidelines of the Northwest Forest Plan do not appear to provide a reasonable assurance of species persistence. Little or no concern for persistence exists when the reserve system and other standards and guidelines of the Northwest Forest Plan (not Survey and Manage) provide a reasonable assurance of persistence. When this assurance of species persistence exists, the species may be removed from the Survey and Manage mitigation measure.

Criteria Indicating a **Concern for Persistence**. One or more of the following factors may indicate that persistence is a concern:

- Low-to-moderate number of likely extant known sites/ records in all or part of a species range.
- Low-to-moderate number of individuals.

- Low-to-moderate number of individuals at most sites or in most populations.
- Very-limited to somewhat-limited range.
- Very-limited to somewhat-limited habitat.
- Distribution within habitat is spotty or unpredictable in at least part of its range.

Criteria Indicating **No Concern for Persistence**. Usually, most of the following criteria need to be met to indicate that a concern for persistence does not exist:

- Moderate-to-high number of likely extant sites/records.
- High proportion of sites and habitat in reserve land allocations, or limited number of sites within reserves, but the proportion or amount of potential habitat within reserves is high and there is a high probability that the habitat is occupied.
- Sites are relatively well distributed within the species range.
- Matrix Standards and Guidelines or other elements of the Northwest Forest Plan provide a reasonable assurance of species persistence.

Concern for persistence is based on existing knowledge and may change over time.

Species Categories

Once species are included in Survey and Manage, they are assigned to one of six management categories (A-F) as shown in Table 2-2. Categories are based on: (1) relative rarity; (2) ability to reasonably and consistently locate occupied sites during surveys prior to habitat-disturbing activities; and, (3) the level of information known about the species or group of species. The species included in Survey and Manage, and the category to which each species, or portion of the range of each species, is assigned, are shown on Table 2-8 at the end of this chapter.

Relative Rarity

Species that are "rare" have a higher concern for persistence than species that are "uncommon." Management direction for rare and uncommon species is different because relative rarity changes the level of concern and, subsequently, the management needed to provide for a reasonable assurance of persistence.

A determination that a species is "rare" is based on a combination of information, as described in the criteria for each category. A species may be rare if it has: (1) limited distribution; (2) a low

Table 2-2. Survey and Manage Categories and Management Requirements.

Relative Rarity	Pre-Disturbance Surveys Practical	Pre-Disturbance Surveys Not Practical	Status Undetermined
Rare	**Category A** – 58 species • Manage All Known Sites • Pre-Disturbance Surveys • Strategic Surveys	**Category B** – 188 species • Manage All Known Sites • N/A • Strategic Surveys	**Category E** – 33 species • Manage All Known Sites • N/A • Strategic Surveys
Uncommon[3]	**Category C** – 6 species • Manage High-Priority Sites • Pre-Disturbance Surveys • Strategic Surveys	**Category D** – 17 species[1] • Manage High-Priority Sites • N/A • Strategic Surveys	**Category F** – 13 species[2] • N/A • N/A • Strategic Surveys

Species do not total 304 because the 4 arthropod guilds are included in Category F, and for 7 species, different areas of 1 their geographic ranges are assigned to different categories. 1

[1] Includes three species with pre-disturbance surveys practical but not necessary. 1

[2] Includes one species of mollusk for which management of all sites known as of 9/30/99 is required as a mitigation 1 measure. 1

[3] Includes 5 species that have part of their geographic range in the rare category, one species whose range includes 1 Categories C and D, and 4 Category F arthropod guilds. 1

number of sites or individuals per site; (3) highly specialized habitat requirements; (4) declining habitat or population trends; (5) reproductive characteristics that limit population growth rates; (6) restricted distribution pattern relative to range or potential habitat; and/or, (7) narrow ecological amplitude.

A determination that a species is "uncommon" is based on information that indicates a species may have: (1) more widespread distribution; (2) higher numbers of sites; (3) low-to-high number of individuals per site; (4) more stable populations or habitats; (5) less restricted distribution pattern relative to range or potential habitat; and/or, (6) moderate-to-broad ecological amplitude.

Ability to Reasonably and Consistently Conduct Pre-Disturbance Surveys

Pre-disturbance surveys are "clearance" surveys that are completed when projects may disturb species habitats. They are conducted prior to signing NEPA documents with the goal of reducing the potential inadvertent loss of sites by searching specified habitats before habitat-disturbing activities occur.

Pre-disturbance surveys are defined as "practical" if a reasonable effort is likely to determine the presence of a species on a specific area. Put another way, practicality of surveys generally relates to the ability to confidently answer questions about species presence through surveys, while avoiding unreasonable costs or spending unreasonable amounts of time. Surveys before habitat disturbance are considered practical if all of the following criteria apply:

- The species appears annually or predictably, producing identifying structures that are visible for a predictable and reasonably long time.
- The species is not so minuscule or cryptic as to be barely visible.
- The species can authoritatively be identified by more than a few experts, or the number of available experts is not so limited that it would be impossible to accomplish all surveys or identifications for all proposed habitat-disturbing activities in the Northwest Forest Plan area needing identification within the normal planning period for the activity.
- The species can be readily distinguished in the field and needs no more than simple laboratory or office examination to confirm its identification.
- Surveys do not require unacceptable safety or species risks.
- Surveys can be completed in two field seasons (approximately 7-18 months).
- Credible survey methods for the species are known or can be developed within a reasonable time period (approximately 1 year).

Level of Knowledge About a Species

Species are assigned to Categories E and F if there is insufficient knowledge to determine whether they meet the three basic criteria for inclusion in Survey and Manage mitigation measure.

Project Analysis Requirements

Surveys prior to habitat-disturbing activities are required for some Survey and Manage species. Such surveys help gather relevant information during the NEPA process so that it is available to the decision-maker before actions are taken. Ideally, this information would be available to Interdisciplinary Teams during preparation of an EA or Draft EIS so it could be used in project analysis, formulation of alternatives, and evaluation of effects. Required surveys should be completed and their results included in an EA or Draft EIS whenever practicable. This would have the added advantage that results would be available during the public review and comment process.

Surveys Prior to Habitat-Disturbing Activities

Categories A and C (64 species) require that site-specific surveys be conducted prior to signing NEPA decisions or decision documents for habitat-disturbing activities. In Survey and Manage, these are called pre-disturbance surveys and they focus on the project unit with the objective of reducing the inadvertent loss of undiscovered sites by searching specified potential habitats prior to making decisions about habitat-disturbing activities. They are done according to the Survey Protocol for each species and can use methods such as transects or plots that focus on priority habitats, habitat features, or involve the entire project area. Generally pre-disturbance surveys are only prescribed for species for which they are practical. "Equivalent-effort" surveys are prescribed as a mitigation measure for five mollusk species whose characteristics, such as small size and identifying characteristics, prevent them from being consistently located during site-specific surveys.

Habitat-Disturbing Activities are disturbances likely to have a substantial negative impact on the species' habitat, its life cycle, microclimate, or life support requirements.

Survey Protocols provide guidelines for pre-disturbance surveys. These are interagency documents describing the survey techniques needed to have a reasonable chance of locating the species when it is present on the site, or needed to make an equivalent-effort of locating the species when it is present on the site.

Line officers should seek specialists' recommendations to help determine the need for a survey based on site-specific information.

Pre-disturbance surveys are not required for wildland fires for resource benefits that take place in congressionally designated Wilderness areas. These are fires that result from natural ignition, such as a lightning strike, and are allowed to burn because they are resulting in resource benefits consistent with pre-approved plans. In this case, pre-disturbance surveys would be impractical given the large area covered and the irregular nature of natural ignitions.

Pre-disturbance surveys are not required in the unusual circumstance that a delay in implementation of the activity (to permit pre-disturbance surveys) would result in greatly increased and unacceptable environmental risk. Such circumstances are subject to review by the REO to ensure the urgency of the activity justifies the risk to species.

Another exception, subject to REO review, is for wildland fires for resource benefits that are planned in Wilderness Study Areas, roadless areas, and other areas where the objectives are similar to those in Wilderness. Where appropriate, such exceptions are available for Late-Successional Reserves.

Site Management

Known sites are historic and current locations of a species reported by a credible source, available to field offices, and that do not require additional species verification or survey by the Agency to locate the species. Known sites include those sites known prior to the signing of the Northwest Forest Plan Record of Decision (USDA, USDI 1994b), as well as sites located since then. Known sites are typically found during pre-disturbance or strategic surveys. Known sites are documented and recorded in the ISMS (Interagency Species Management System) database.

Manage All Known Sites applies to rare species and means all current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, coupled with locally specific information, and advice from taxa specialists about the species, may be used to identify occasional sites not needed for persistence. These exceptions will be reviewed by the REO.

Manage High-Priority Sites applies to uncommon species and means only high-priority sites need to be managed according to the Management Recommendation for the species. However, until a Management Recommendation is written addressing high-priority sites for the species, either assume all sites are high priority or, with guidance from the Interagency Survey and Manage Program Manager, determine locally that the known site is not high priority. Professional judgment, coupled with locally specific information and advice from taxa specialists about the species, may be used to identify occasional high-priority sites not needed for persistence. These exceptions will be reviewed by the REO.

Conservation Strategies

Management Recommendations are interagency documents that address how to manage known sites and provide guidance for conserving Survey and Manage species. They describe the habitat parameters that will provide for maintaining the species at the site. They are the responsibility of management working closely with taxa experts and are developed by taxa experts and land managers (at any administrative level) for use at field offices. They are subject to review by the REO.

Management Recommendations may also provide information on natural history, current species status, species distribution, management goals, and objectives. They can also include specific management actions or recommendations, monitoring needs, and needs for information and research to the extent such information supports management of known sites, identification of high-priority sites, and identification of survey priorities.

They also provide guidance for site-specific decisions about what management activities are appropriate within the site. The size of the area to be managed depends on the habitat and requirements for the species. Management may range from maintaining one or more habitat components (such as down logs or canopy cover) to complete exclusion from disturbance for many acres, and may allow loss of some individuals, areas, or elements not affecting continued site occupancy.

For uncommon species, Management Recommendations identify high-priority sites that must be managed, as well as sites that no longer need to be managed.

Inventories

Inventory is conducted though “strategic surveys.” Strategic surveys are landscape-scale surveys designed to collect information about a species, including its presence and habitat. They are required for all Survey and Manage species. Information provided by strategic surveys (as well as research and other information-gathering efforts) helps address fundamental questions about Survey and Manage species, including: (1) is there a concern for persistence? (2) is the species rare or uncommon? (3) is the species closely associated with late-successional forests? (4) what is the appropriate management for the species? and, (5) do the reserve land allocations and other standards and guidelines of the Northwest Forest Plan provide a reasonable assurance of species persistence? Information from strategic surveys is used in the annual species review process and is incorporated into Management Recommendations and Survey Protocols. Strategic surveys are prescribed for all categories. Once strategic surveys have helped answer these questions, or further surveys are not expected to contribute significant additional information, strategic surveys may be complete even if few or no additional sites are found.

Strategic surveys are different from pre-disturbance surveys because they are focused on gathering information about the species and its habitat needs range-wide, and are not focused on determining presence or absence in specific areas prior to habitat-disturbing activities.

Because Category B species are rare and do not have pre-disturbance surveys, completing strategic surveys is a high priority. For this category, the standards and guidelines require: "To reduce the inadvertent loss of undiscovered sites, the Agencies will not sign NEPA decisions or decision documents for habitat-disturbing activities in old-growth forest (a sub-set of late-successional forest - see glossary) in fiscal year 2006 (fiscal year 2011 for fungi) and beyond, unless either:

- "strategic surveys have been completed [as defined in the standards and guidelines] for the province that encompasses the project area, or
- "surveys equivalent to pre-disturbance surveys have been conducted in the old-growth habitat to be disturbed."

Adding/Removing Species

The Annual Species Review is a detailed process for annually analyzing new information about species and moving them to new categories, or removing them from or adding them to, Survey and Manage. This process is based on new information about the species regarding numbers, distribution, and other factors indicating risk to persistence. New information about species is also used to develop or revise Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide.

The adaptive management process includes the following steps.

1. Acquiring new information relative to Survey and Manage species. New information about species status or needs is generated through strategic surveys, pre-disturbance surveys, and other sources. This information is maintained primarily in the ISMS database.

2. Evaluating new information. A regional-level, interagency group including taxa experts, meeting at least annually, weighs new information against the persistence and category criteria to determine if additions or deletions of species from Survey and Manage or changes of species among categories, are warranted. Similarly, when new information indicates that a species no longer meets the Survey and Manage basic criteria, the species will be removed. Removed species can be considered for inclusion in the Agencies' Special Status Species Programs. In particular, for species that are removed from Survey and Manage because they are found not to be associated with late-successional or old-growth forests, their known sites will continue to be managed until it is determined whether they are eligible for the Agencies' Special Status Species Programs.

3. Implementing changes or refinements to Survey and Manage. Changes include adding and removing species, and changing species between categories, as well as changes to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide. Changes are the responsibility of management working closely with taxa experts and may be made without further NEPA documentation. Changes are reflected in subsequent project planning documents.

The results are reviewed by the RIEC to ensure that current information about the species has been appropriately considered and weighed against the stated criteria, and that proposed reassignments continue to provide at least the level of protection intended by the standards and guidelines.

Reports, Monitoring, and Review

Annual Status Reports are required and will, at minimum, include: (1) the results of adaptive management changes; (2) status of Management Recommendations and Survey Protocols; (3) a summary of the Strategic Survey Implementation Guide (including the status of strategic surveys); (4) status and results of ongoing monitoring; and, (5) important new management direction. This

report is the primary tool for the public to learn about annual changes to species assignments and resultant application of surveys to activities. The Agencies maintain a mailing list for all persons wishing to receive all or part of this report.

Monitoring will continue in accordance with existing monitoring requirements for the Northwest Forest Plan and for the land and resource management plans for each of the Forest Service and BLM administrative units within the Northwest Forest Plan area. No new monitoring requirements are proposed under Alternative 1.

Review by the REO or the RIEC is required for eight different documents or processes included in the Survey and Manage Standards and Guidelines. Three documents, Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide, each play an important role in accomplishing Survey and Manage objectives and are subject to review by the REO to ensure they identify and integrate the habitat or life-history factors key to managing the species to the level of protection intended in the standards and guidelines. Other processes (e.g., exceptions to management of known sites and changes in categories resulting from the annual species analysis) are also subject to REO or RIEC review. The REO or RIEC may develop criteria to exempt certain documents or processes from review.

Alternative 2, Proposed Action (Northwest Forest Plan without Survey and Manage)

The Agencies propose to amend all of their land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines.

Separate from this proposal, the Agencies reviewed the 304 Survey and Manage species to determine their eligibility for inclusion in the Agencies' existing Special Status Species Programs (details about these programs are described below).

If Alternative 2 is selected, the analysis in this SEIS assumes that the Regional Foresters and State Directors will make decisions under their existing procedures for modifying their Special Status Species Program lists, to add the appropriate species as displayed on Table 2-8 (located at end of this chapter). Those decisions are expected to apply to all future NEPA decisions except those projects that have met all requirements for the Survey and Manage mitigation measure prior to signing of the Record of Decision for this SEIS. For those projects, decisions affecting the 304 Survey and Manage species may be based on conclusions, findings, and mitigations under the Survey and Manage Standards and Guidelines and need not address those species under the Special Status Species Programs. Survey and Manage Standards and Guidelines will continue to apply to activities with decision documents signed before the Record of Decision for this SEIS.

The Survey and Manage Standards and Guidelines Sections I-VIII and XII (USDA, USDI 2001, Attachment 1) would be removed in their entirety. The description of Management Recommendations and the explanation of how they are revised would continue to apply to certain cavity nesting birds and some bat roosts as referenced in Sections IX and XI, respectively. The Canada lynx Standard and Guideline, Section X, would also continue to apply.

Alternative 2 continues implementation of all other elements of the Northwest Forest Plan, continues the underlying land and resource management plans for the individual administrative units, and continues relevant agency programs and policies. None of the species affected by this proposal are currently listed as threatened, endangered, or proposed for listing under the Endangered Species Act.

Program Objectives - Special Status Species

The Forest Service' Sensitive Species Program and the BLM's Special Status Species Program are similar (a comparison table for both programs, and Survey and Manage, is displayed in Appendix 2). Both programs seek to further the objectives of the Endangered Species Act by preventing future listings of species as threatened or endangered, and both programs require coordination with state and other federal agencies to achieve conservation goals of species identified by state governments. The objectives of the Forest Service' Sensitive Species Program also include compliance with NFMA regulations requiring diversity of plant and animal communities, and requiring habitat to be managed to maintain viable populations of existing native and desired non-native vertebrate species.

BLM Policy: To ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, either under provisions of the Endangered Species Act or other provisions of this policy (BLM Manual 6840.02 B).

Forest Service Policy:

1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.
2. Maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.
3. Develop and implement management objectives for populations and/or habitat of sensitive species.

Agency manual direction and/or regional policies for the Agencies' Special Status Species Programs can be found on the internet by starting at http://www.or.blm.gov/surveyandmanage/.

Number of Species and Taxa

Not all of the 304 rare or little known species (and 4 arthropod guilds) qualify for the Agencies' Special Status Species Programs. Agency personnel, using the criteria specific to their agency and region, considered which Survey and Manage species to recommend for inclusion in one or more of the Agencies' Special Status Species Programs.

Out of 304 Survey and Manage Species, 130 species are eligible for the Agencies' "sensitive" and "assessment" (Oregon /Washington BLM only) categories, including 36 species that were already listed as sensitive or assessment. An additional 84 Survey and Manage species were found eligible for the Oregon/Washington BLM "tracking" category. Sensitive, tracking, and assessment categories are described below. Forest Service Regional Foresters and BLM State Directors are responsible for designating or removing species from their programs. It is assumed that qualifying species will be added to the Agencies' Special Status Species Programs and that this is a reasonably foreseeable result. For analysis purposes, this assumption is considered in the effects discussions in Chapter 3&4. These probable species placements are shown on Table 2-8 at the end of this chapter. Taxa that are assumed to be included in these programs under Alternative 2 are shown in Table 2-3.

Standards for Inclusion

For both agencies, standards for including species in the Special Status Species Programs are established at the National level through their respective directives systems.

Table 2-3. Number of Survey and Manage Species Eligible to be Included in the Agencies' Special Status Species Programs.

Taxon	**BLM OR/WA[1, 5]**		**BLM CA**		**FS R-6**		**FS R-5**		**ANY[2]**		
	2002[3]	Add[4]	2002[3]	Add[4]	2002[3]	Add[4]	2002[3]	Add[4]	2002[3]	Add[4]	**Total**
Fungi	0	23	0	23	0	7	0	8	0	49	**49**
Lichens	4	8	1	9	0	22	0	3	5	23	**28**
Bryophytes	9	2	0	4	0	3	0	1	9	4	**13**
Vertebrates	2	0	0	1	4	0	1	2	4	1	**5**
Mollusks	8	5	0	4	0	10	0	6	8	17	**25**
Vasc Plants	3	3	0	2	9	0	5	0	10	0	**10**
Totals	**26**	**41**	**1**	**43**	**13**	**42**	**6**	**20**	**36**	**94**	**130**

[1] Includes both Bureau Sensitive and Bureau Assessment species. Bureau Tracking species are not included. 1
[2] The ANY column is the total number of species in one or more Agencies' Sensitive or Assessment (BLM 1 OR/WA) categories. This is not the total of the other four columns.
[3] The number of Survey and Manage species that were already included in the Agencies' Special Status Species 1 Programs as of December 2002. 1
[4] The number of Survey and Manage species that would probably be added to the Agencies' Special Status 1 Species Programs under Alternative 2, but were not already included in those programs as of December 2002.
[5] This table does not include an additional 84 Survey and Manage species that would become Bureau Tracking 1 (including 26 Survey and Manage species that were already listed as Bureau Tracking) in BLM OR/WA as of 1 December 2002. 1

BLM. State Directors, generally in cooperation with state agencies that are responsible for fisheries, wildlife, and botanical resources, and state natural heritage programs, shall designate BLM sensitive species. The sensitive species designation is normally used for species that occur on Bureau administered land for which BLM has the capability to significantly affect the conservation status of the species through management. The manual direction for the protection of sensitive is the same as for federal candidate species and refers the user to that section of the manual. Therefore, when protection is discussed below, the manual refers to "candidates."

For species other than federally listed, proposed, or candidate species, species may be included that (BLM Manual 6840.06 E):

1. could become endangered in or extirpated from a state, or within a significant portion of its distribution in the foreseeable future,
2. are under status review by the FWS and/or the NOAA Fisheries,
3. are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution,
4. are undergoing significant current or predicted downward trends in population or density such that federally listed, proposed, candidate, or State listed status may become necessary,
5. have typically small and widely dispersed populations,
6. are inhabiting ecological refugia, specialized, or unique habitats, or
7. are State listed but which may be better conserved through application of BLM sensitive species status. Such species should be managed to the level of protection required by State laws or under the BLM policy for candidate species, whichever would provide better opportunity for its conservation.

Forest Service. Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

1. Significant current or predicted downward trends in population numbers or density.
2. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The regions have identified specific global or state Heritage rankings that qualify as sensitive. Regardless of ranking, species are generally only included if sufficient information is available on habitat relationships and life history to evaluate potential effects.

Species Categories

Both Agencies. National direction for both agencies establishes a "sensitive" category and provides latitude to determine how species will be selected for inclusion. Forest Service Regional Foresters and BLM State Directors have leeway to design and implement their Special Status Species Programs in accordance with national policies. A detailed comparison of various aspects of the different agency and regional programs, including criteria for inclusion, is included in Appendix 2.

Direction in agency manuals permits or encourages use of State or Heritage rankings to serve, at least in part, as the basis for meeting the criteria for inclusion. The rankings system was originally developed by The Nature Conservancy and is now maintained by NatureServe in cooperation with Heritage Programs or Conservation Data Centers in all 50 states, 10 Canadian provinces, and 13 Latin American countries. In Oregon, the global (and state) rankings are further refined by the Oregon Natural Heritage Program (ONHP) (operated by the Oregon Natural Heritage Information Center) into four lists. Descriptions of the rankings can be found on the internet at http://oregonstate.edu/ornhic/tebook.pdf. These rankings are summarized in Appendix 3.

Rankings are based primarily on total number of known or expected extant populations for global or state ranks, and the degree to which they are potentially or actively threatened with destruction. In order to determine Survey and Manage species eligibility for the Agencies' Special Status Species Programs, in October 2002, the Agencies contracted with the Oregon Natural Heritage Information Center (ONHIC) to evaluate all Survey and Manage species for global and state rankings for Washington, Oregon, and California. Some species had previously been evaluated by ONHIC and these evaluations were updated. The ISMS database, a list of Survey and Manage Species, and the Annual Species Review process summaries were supplied to ONHIC. State rankings for Washington and California were also developed using criteria from those states. ONHP rankings and agency criteria for inclusion in the Agencies' Special Status Species Programs are not based solely on local abundance but also consider habitat distribution, threats, global population levels, and other factors.

The two agencies and four regions have considerable discretion to decide what rankings and other factors to consider when placing species in their respective sensitive categories, so there are differences regarding which species are included on what list.

BLM. The BLM in Oregon/Washington chooses to add assessment and tracking categories in addition to the national sensitive category (BLM Instruction Memorandum OR-91-57, November 5, 1990). The Bureau Sensitive category is managed the same in both BLM Oregon/Washington and BLM California. Bureau Sensitive species are managed according to the BLM's national policy (BLM Manual 6840 - Special Status Species Management). The Bureau Assessment category is similar to Bureau Sensitive except protection, mitigation, and monitoring are optional; and pre-project clearances are subject to available personnel and funding. The Bureau Tracking category includes species of concern for which management is optional. Field units are encouraged to record sightings of tracking species. Field sightings are used to determine future status of the species.

In Oregon/Washington, BLM sensitive, assessment, and tracking status tiers to a heritage program synthesis of rankings and threat, resulting in their lists 1 through 4. Sensitive species are those on List 1, being "…taxa that are threatened with extinction or presumed to be extinct throughout their entire range." California BLM uses the similar California Native Plant Society List 1-B to identify sensitive plants, and coordination with California Department of Fish and Game for identification of sensitive animals.

For BLM, species are only included "that occur on Bureau lands for which BLM has the capability to significantly affect the conservation status of the species through management." However, the BLM Oregon/Washington list is inclusive of any ONHP List 1 through 4 species and is not screened for management capability at the state level. Screening occurs at the field level pending local capability to significantly affect conservation status and whether the species is documented or suspected to inhabit BLM administered lands. California BLM includes some species that are highly suspected of inhabiting BLM administered lands in California, but have not been documented as occurring on BLM administered lands in the state. Like BLM Oregon/ Washington, screening occurs at the field level.

Forest Service**.** Forest Service Regions 5 and 6 have established Regional Forester's Sensitive Species lists that include only the sensitive category. The Forest Service in Region 5 encourages Forests to establish a "Watch" list of species that do not meet all the criteria required to be included on the Regional Forester's Sensitive Species list, but which may be locally important.

Both regions include species for which "viability is a concern" with Region 5 (California) adding that there must be "enough information to make a determination regarding effects of management activities." Region 6 (Washington and Oregon) applies a similar standard because final inclusion is up to the Regional Forester following a review that includes implementation feasibility. Both Regions can add species that are state listed as threatened or endangered, or species that otherwise have a need.

Project Analysis Requirements

BLM. The BLM should obtain and use the best available information deemed necessary to evaluate the status of special status species in areas affected by land use plans or other proposed actions and to develop sound conservation practices. Land use plans shall be sufficiently detailed to identify and resolve significant land use conflicts with special status species without deferring conflict resolution to implementation-level planning. Implementation-level planning should consider all site-specific methods and procedures which are needed to bring the species and their habitats to the condition under which the provisions of the ESA are not necessary, current listings under special status species categories are no longer necessary, and future listings under special status species categories would not be necessary (BLM manual 6840.22(A)).

Bureau Sensitive. Analyze effects of the proposed action on potentially affected species. Request technical assistance, if appropriate, from FWS, NOAA Fisheries, or other qualified sources. Avoid taking actions that would contribute to the need to list the species under the ESA. Impacts by BLM actions to the population and to the species as a whole will be determined in the environmental assessment process.

Bureau Assessment (OR/WA only). Species are recommended for analysis and management contingent on district budget, expertise, and "in balance with other resource considerations." Impacts are considered on a case-by case basis in NEPA process.

Bureau Tracking (OR/WA only). To enable the state natural heritage program to determine appropriate state rankings, collection of occurrence data is encouraged and reported if observed. Bureau Tracking is not considered a special status species for management purposes.

Forest Service. The Forest Service' 2670 Manual (June 23, 1995) requires:

As part of the NEPA process, review programs and activities through a biological evaluation, to determine their potential effect on sensitive species. The biological evaluation analyzes the proposed action and the significance of potential adverse effects on the population or its habitat within the area and on the species as a whole, and makes recommendations for removing, avoiding, or compensating for any adverse effect. It must be prepared by a journey-level biologist or botanist and include: (1) sensitive species that may be present; (2) identification of occupied and unoccupied habitat; (3) an analysis of the effects of the proposed action on the species or their occupied habitat; (4) a discussion of cumulative effects; (5) a determination of no effect, beneficial effect, or may affect; and, (6) recommendations for avoiding or mitigating any adverse effects.

Surveys Prior to Habitat-Disturbing Activities

Pre-project clearances, clearance surveys, pre-disturbance surveys, field clearances, field reconnaissance, inventories, and habitat examinations are terms used to describe activities to learn whether a species is present or potentially present in a geographic area. These pre-project clearances are completed prior to habitat-disturbing activities to determine the presence of a species or its habitat and the effect of management actions on the species.

BLM. In general, BLM only conducts pre-project clearances for those sensitive species where BLM administered lands or actions have a significant effect on their status.

Bureau Sensitive. To ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need to list any sensitive species as threatened or endangered, conduct inventories (i.e. pre-project clearances) to determine the impacts of such actions on any sensitive species that might be within the area of a proposed project. Inventories are to be conducted at the time of year when species can be found.

The manual for BLM California goes on to present a decision key for determining the minimum level of inventory, at least for sensitive plants, based on the probability of occurrence of the species and the level of habitat disturbance associated with the proposed activity. Survey exceptions require approval by the State Director. Potential effects to sensitive species and their habitats are discussed in the environmental assessment for the proposed activity.

Bureau Assessment (OR/WA only). Pre-project clearances are required contingent upon available funding and personnel.

Bureau Tracking (OR/WA only). Pre-project clearances are optional.

Forest Service. Forest Service policy is to conduct habitat examinations when proposed resource activities or uses would affect wildlife habitat objectives. Such examinations are generally done when needed to conduct biological evaluation effects analysis. They are usually required for sensitive species unless the habitat is assumed occupied or prior surveys of the area are adequate. Pre-disturbance clearances can have several objectives including:

- Assessing potential sensitive species habitat.
- Searching suitable habitat for sensitive species occurrence.
- Confirming known habitat is suitable.
- Refining knowledge of how habitat exists on the landscape and how species use their habitat. This could include travel corridors, relationships between cover and forage areas, human disturbances, and fragile habitat situations.

Site Management

Manual direction concerning species site management is slightly different between the Agencies. Both agencies are required to avoid actions that would contribute to a need to list a species as threatened or endangered under the ESA. Authority to disturb sensitive species sites lies with the agency official who is responsible for authorizing the proposed habitat-disturbing activity.

BLM. For sensitive species, sites will be managed if loss would contribute to the need to list and BLM has the capability to significantly affect the conservation status of the species through management. Coordination with FWS and NOAA Fisheries occurs to determine, to the extent practicable, distribution, population, threats, and/or abundance of species. The BLM will: (1) develop, cooperate in, and implement range-wide or site-specific management plans or conservation strategies; (2) ensure that activities affecting the species are carried out consistent with objectives for managing the species; and, (3) analyze effects of the proposed action on potentially affected species.

Forest Service. Avoid or minimize impacts to species whose viability has been identified as a concern (Forest Service Manual 2670.32). If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. (The line officer with project approval authority makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward federal listing.)

Conservation Strategies

BLM. The protection provided by the policy for candidate species is used as the minimum level of protection for BLM sensitive species (BLM Manual 6840.06 C). Policy regarding conservation strategies for BLM sensitive species is as follows:

1. In coordination with FWS and/or NOAA Fisheries determine, to the extent practicable, the distribution, population dynamics, current threats, abundance, and habitat needs for candidate species occurring on lands administered by the BLM. Evaluate the significance of lands administered by the BLM or actions undertaken by the BLM in maintaining and restoring those species.

2. For candidate species where lands administered by the BLM or BLM authorized actions have a significant effect on their status, manage the habitat to conserve the species by:
   a. Ensuring candidate species are appropriately considered in land use plans.
   b. Developing, cooperating with, and implementing range-wide or site-specific management plans, conservation strategies, and assessments for candidate species that include specific habitat and population management objectives designed for conservation, as well as management strategies necessary to meet those objectives.
   c. Ensuring that BLM activities affecting the habitat of candidate species are carried out in a manner that is consistent with the objectives for managing those species.
   d. Monitoring populations and habitat of candidate species to determine whether management objectives are being met.

To eliminate the need for listings under the ESA, the BLM shall participate in developing habitat conservation assessments leading to conservation agreements for proposed, candidate, and sensitive species, groups of species, or specific ecosystems.

State Directors and line managers should identify opportunities for habitat conservation assessments or, if none exists, initiate the development of these assessments and conservation agreements for the purpose of furthering the conservation of the subject species on BLM-administered and other lands.

The BLM should use habitat conservation assessments to develop conservation agreements that outline the procedural assurance necessary to: (1) reduce, eliminate, or mitigate specific threats to proposed, candidate, or sensitive species; (2) develop an ecosystem management approach to conservation on federal lands; and, (3) facilitate coordination and cooperation with others, such as States and private entities, to achieve species and habitat conservation through an ecosystem management approach that extends beyond federally managed lands.

Regional manual supplements for Oregon/Washington and California summarize this direction, stating that for sensitive species where lands administered by the BLM, or BLM actions, have a significant effect on their status: (1) manage the habitat to conserve the species; (2) prepare management plans when necessary; and, (3) implement active management where needed to prevent listing or to conserve the species. Progress toward meeting species management objectives will be monitored periodically.

Forest Service. To preclude trends toward endangerment that would result in the need for federal listing, units must develop conservation strategies for those sensitive species whose continued existence may be negatively affected by the forest plan or a proposed project. To devise conservation strategies, first conduct biological assessments of identified sensitive species. In each assessment, meet these requirements:

1. Base the assessment on the current geographic range of the species and the area affected by the plan or project. If the entire range of the species is contained within the plan or project area, limit the area of analysis to the immediate plan or project area. If the geographic range of the species is beyond the plan or project area, expand the area of analysis accordingly.

2. Identify and consider, as appropriate for the species and area, factors that may affect the continued downward trend of the population, including such factors as: distribution of habitats, genetics, demographics, habitat fragmentation, and risk associated with catastrophic events.

3. Display findings under the various management alternatives considered in the plan or project (including the no action alternative) (FSM 2621.2).

For sensitive plants in Region 5, as National Forest inventories for sensitive plants are completed, long-range species and/or habitat management guides are prepared and incorporated into forest plans. These guides are not intended to be exhaustive, but are designed as work plans, providing site-specific objectives, activities, and time tables for implementation. The guides specify monitoring and periodic review to ensure that it is working to benefit the species. As new data becomes available, it is incorporated into species management guides. Effective implementation of these guides should ensure the long-term viability of sensitive species, thereby, preventing the need to list the species under the ESA.

In Region 6, conservation strategies are developed for candidate and sensitive species. The strategy is based on the best scientific information available for the species and usually includes an outline of the biological limiting factors, recommended conservation measures to manage or protect the species, and a monitoring plan.

Inventories

General inventories are done to learn more about a species distribution and status. These surveys can be done to help develop conservation strategies.

BLM. For species where BLM administered lands or BLM authorized actions have a significant effect on their status, general inventories may be conducted to develop management plans, conservation strategies, and assessments. Species-specific, range-wide inventories are not required.

For sensitive species, the Oregon/Washington manual supplement recommends general inventory where needed to determine species distribution and status, and monitoring to determine the species' requirements and trends.

Forest Service. Inventories are encouraged where needed to support biological evaluations and establish management objectives for conservation of sensitive species. Inventories are not required.

Adding/Removing Species

The heritage program rankings are updated on a regular cycle of 2-3 years, depending on the state. These rankings are then published or posted on their websites. The BLM sensitive species list in Oregon/Washington is considered to include all ONHP List 1 species, with few exceptions, when new rankings are published. The State Director is able to accept, add, or remove ranked species as information warrants. In addition, BLM District managers can nominate species for addition or deletion.

Forest Service sensitive species lists are updated at the discretion of the Regional Forester. Region 5 (California) is on a 2-3 year update cycle. Region 6 (Washington and Oregon) periodically updates the list as demand warrants.

Reports, Monitoring, and Review

Monitoring will continue in accordance with existing monitoring requirements for the Northwest Forest Plan and for the land and resource management plans for each of the Forest Service and BLM administrative units within the Northwest Forest Plan area. No new monitoring requirements are proposed under Alternative 2.

Formal reviews or reports regarding special status species are not required.

BLM. The BLM State Director is responsible for monitoring implementation of the special status species program and recommending changes to ensure compliance with law, regulation, and policy and to maintain effectiveness of the program. BLM policy is to monitor populations and habitats of candidate (sensitive) species to determine whether management objectives are being met. Monitoring should be included in conservation strategies.

BLM OR/WA. Monitoring is required for Bureau Sensitive species where lands administered by the BLM or BLM actions have a significant effect on their status. Monitoring should be designed on a case-by-case basis at the intensity appropriate for the monitoring objective (related to an EA, to species trend, or species/habitat management). Monitoring is optional for Bureau Assessment and Bureau Tracking species.

BLM CA. For sensitive plants, BLM California prioritizes sensitive species for monitoring based upon degree of rarity, existing threats, and potential conflicts. Plant species with the highest rating are monitored annually while others are monitored every 3-5 years. A study plan is developed and peer reviewed for each species being monitored.

Forest Service. Monitoring should be proposed as necessary to determine if wildlife, fish, and other resource objectives are being met. Develop and implement management strategies (objectives, management prescriptions, and monitoring) to meet riparian habitat goals for dependent fish and wildlife species.

Region 6. Include a monitoring plan in conservation strategies for candidate and sensitive species.

Region 5. For sensitive plants, monitor key populations and specify monitoring and periodic review in species management guides to ensure that the guide is working to benefit the species.

Potential Mitigation

Analysis of environmental consequences for Alternative 2 indicates that removing the Survey and Manage requirements for known site management and/or pre-disturbance surveys would put some species at high risk of extirpation in all or part of their range. In these cases, analysis indicates that mitigation in the form of continued site management and/or pre-project clearances would effectively eliminate the high risk of extirpation (refer to Chapter 3&4).

Alternative 3, (Northwest Forest Plan with Modified Survey and Manage)

Under Alternative 3, the Agencies would amend 28 land and resource management plans within the range of the northern spotted owl by modifying the Survey and Manage Standards and Guidelines. Modifications include: (1) removing the uncommon species category and all requirements pertaining to them; (2) eliminating the requirement to conduct pre-disturbance surveys in non-late-successional and non-old-growth forest stands; (3) changing the review requirements for excepting known sites from management; and, (4) changing the review process for excepting pre-disturbance survey requirements for Wildland Fire for Resource Benefits.

Thirty-two Survey and Manage species plus 4 arthropod guilds are currently categorized as uncommon (see Table 2-2). However, only 26 species would be removed entirely from the Survey and Manage Standards and Guidelines because 5 of these species have part of their range in the rare species category and one species is included in two uncommon categories. Since the removed species might be eligible for the Agencies' Special Status Species Programs, the Agencies have reviewed their eligibility for those programs and found that 9 of the 26 species would be eligible (details about the Agencies' Special Status Species Programs are summarized under Alternative 2). The Survey and Manage Standards and Guidelines, as modified by Alternative 3, are included in Appendix 4. Key features of Alternative 3 are summarized below.

If Alternative 3 is selected, the analysis in this SEIS assumes that the Regional Foresters and State Directors will make decisions under their existing procedures for modifying their Special Status Species Program lists, to add the nine eligible uncommon species (Categories C, D, and F) as displayed on Table 2-8 (located at end of this chapter). Those decisions are expected to apply to all future NEPA decisions except those projects that have met all requirements for the Survey and Manage mitigation measure prior to signing of the Record of Decision for this SEIS. For those projects, decisions affecting the nine eligible uncommon species may be based on conclusions, findings, and mitigations under the Survey and Manage Standards and Guidelines and need not address those species under the Special Status Species Programs. The 2001 Survey and Manage Standards and Guidelines will continue to apply to activities with decision documents signed before the Record of Decision for this SEIS.

Alternative 3 continues implementation of all other elements of the Northwest Forest Plan, continues the underlying land and resource management plans for the individual administrative units, and continues relevant agency programs and policies. None of the species affected by this alternative are currently listed as threatened, endangered, or proposed for listing under the Endangered Species Act.

Program Objectives

Program objectives for the Survey and Manage mitigation measure are the same as those described under Alternative 1. Program objectives for the Agencies' Special Status Species Programs are the same as those described under Alternative 2.

Number of Species and Taxa

The Survey and Manage mitigation measure would apply to 278 species in all or part of their range. Taxa would include: vertebrates, bryophytes, mollusks, vascular plants, fungi, and lichens. Species currently assigned to Category A, B, or E as shown on Table 2-8 would be included. Species currently assigned to Category C, D, or F would not be included in the Survey and Manage mitigation measure.

Nine of the Category C, D, or F species that would be removed from Survey and Manage mitigation measure are assumed to be added to one or more of the Agencies' Special Status Species Programs (see Table 2-4).

Standards for Inclusion

Survey and Manage has three basic criteria (see box included with Alternative 2 description) that must be met for a species to be included in the Survey and Manage Standards and Guidelines. Species no longer meeting these criteria will be removed; species meeting the criteria can be added. (Note: Since uncommon species are not included in Survey and Manage under Alternative 3, the criteria addressing concern for persistence reflect a higher threshold of concern than under Alternative 1.)

Table 2-4. Number of Uncommon Survey and Manage Species Eligible to be Included in the Agencies' Special Status Species Programs.

Taxon	**BLM OR/WA[1,5]**		**BLM CA**		**FS R-6**		**FS R-5**		**ANY[2]**		
	2002[3]	Add[4]	2002[3]	Add[4]	2002[3]	Add[4]	2002[3]	Add[4]	2002[3]	Add[4]	**Total**
Fungi	0	0	0	1	0	0	0	0	0	1	**1**
Lichens	0	0	0	1	0	2	0	0	0	3	**3**
Bryophytes	0	0	0	0	0	0	0	0	0	0	**0**
Vertebrates	1	0	0	0	1	0	0	0	1	0	**1**
Mollusks	1	0	0	1	0	1	0	0	1	1	**2**
Vasc Plants	1	0	0	2	1	0	2	0	2	0	**2**
Totals	**3**	**0**	**0**	**5**	**2**	**3**	**2**	**0**	**4**	**5**	**9**

[1] Includes both Bureau Sensitive and Bureau Assessment species. Bureau Tracking species are not included. 1
[2] The ANY column is the total number of species in one <u>or more</u> Agencies' Sensitive or Assessment (BLM OR/WA) categories. This is not the total of the other four columns. 1
[3] The number of Uncommon Survey and Manage species that were already included in the Agencies' Special Status 1 Species Programs as of December 2002. 1
[4] The number of Uncommon Survey and Manage species that would probably be added to the Agencies' Special Status Species Programs under Alternative 3, but were <u>not</u> already included in those programs as of December 2002. 1
[5] Table does not include an additional six Survey and Manage species that would become Bureau Tracking (including two Survey and Manage species that were already listed as Bureau Tracking) in BLM OR/WA Special Status Species 1 Program as of December 2002). 1

Concern for persistence is one of the basic criteria for applying the Survey and Manage mitigation measure to a species. A concern for persistence exists when the reserve system and other standards and guidelines of the Northwest Forest Plan do not appear to provide a reasonable assurance of species persistence. Little or no concern for persistence exists when the reserve system and other standards and guidelines of the Northwest Forest Plan (not Survey and Manage) provide a reasonable assurance of persistence. When this assurance of species persistence exists, the species may be removed from the Survey and Manage mitigation measure.

Criteria Indicating a **Concern for Persistence**. One or more of the following factors may indicate that persistence is a concern:

- Low number of likely extant known sites/records in all or part of a species range.
- Low number of individuals.
- Low number of individuals at most sites or in most populations.
- Very-limited range.
- Very-limited habitat.
- Distribution within habitat is spotty or unpredictable in a substantial portion of its range.

Criteria Indicating **No Concern for Persistence**. Usually, most of the following criteria need to be met to indicate that a concern for persistence does not exist:

- Moderate-to-high number of likely extant sites/records.
- Moderate-to-high proportion of sites and habitat in reserve land allocations, or limited number of sites within reserves, but the proportion or amount of potential habitat within reserves is moderate-to-high and there is moderate-to-high probability that the habitat is occupied.
- Sites are relatively well distributed or only partially restricted within the species range.
- Matrix Standards and Guidelines or other elements of the Northwest Forest Plan provide a reasonable assurance of species persistence.

Concern for persistence is based on existing knowledge and may change over time. While concern will remain for some species that are truly rare, the concern for many species will be alleviated as more information is accumulated through pre-disturbance and strategic surveys, and considered with the criteria indicated above. A species for which there is no longer a concern for persistence will be removed from the Survey and Manage mitigation measure as described in the adaptive management section.

Species Categories

Species included in Survey and Manage would be assigned to one of three management categories (A, B, or E) as shown in Table 2-5. Categories are based on: (1) ability to reasonably and consistently locate occupied sites during surveys prior to habitat-disturbing activities, and (2) the level of information known about the species or group of species. The species included in Survey and Manage, and the category to which each species, or portion of the range of each species, is assigned, are shown on Table 2-8 at the end of this Chapter.

Ability to Reasonably and Consistently Conduct Pre-Disturbance Surveys

Pre-disturbance surveys are pre-project clearances done for projects that may disturb species habitats. They are conducted prior to signing NEPA documents with the goal of reducing the inadvertent loss of sites by searching specified habitats.

Pre-disturbance surveys are defined as practical if a reasonable effort is likely to determine the presence of a species on a specific area. Put another way, practicality of surveys generally relates to the ability to confidently answer questions about species presence through surveys, while avoiding unreasonable costs or spending unreasonable amounts of time.

Table 2-5. Alternative 3 Survey and Manage Categories and Management Requirements.

Pre-Disturbance Surveys Practical	Pre-Disturbance Surveys Not Practical	Status Undetermined
Category A – 58 species • Manage All Known Sites • Pre-Disturbance Surveys in LS/OG Forests • Strategic Surveys	**Category B** – 188 species • Manage All Known Sites • N/A • Strategic Surveys	**Category E** – 33 species • Manage All Known Sites • N/A • Strategic Surveys

Species do not total 278 because for 1 species, different areas of its geographic range are assigned to different categories.
LS/OG = Late-successional and/or old-growth forest stands

Surveys prior to habitat disturbance are considered practical if all of the following criteria apply:

- The species appears annually or predictably, producing identifying structures that are visible for a predictable and reasonably long time.
- The species is not so minuscule or cryptic as to be barely visible.
- The species can authoritatively be identified by more than a few experts, or the number of available experts is not so limited that it would be impossible to accomplish all surveys or identifications for all proposed habitat-disturbing activities in the Northwest Forest Plan area needing identification within the normal planning period for the activity.
- The species can be readily distinguished in the field and needs no more than simple laboratory or office examination to confirm its identification.
- Surveys do not require unacceptable safety or species risks.
- Surveys can be completed in two field seasons (approximately 7-18 months).
- Credible survey methods for the species are known or can be developed within a reasonable time period (approximately 1 year).

Level of Knowledge About a Species

Species are assigned to Category E if there is insufficient knowledge to determine whether they meet the three basic criteria for inclusion in the Survey and Manage mitigation measure.

Species categories for special status species are described under Alternative 2.

Project Analysis Requirements

Project analysis requirements for Survey and Manage species would be the same as described for Alternative 1. Project analysis requirements for special status species would be the same as for Alternative 2.

Surveys Prior to Habitat-Disturbing Activities

Category A requires that pre-disturbance surveys be conducted prior to signing NEPA decisions or decision documents for habitat-disturbing activities in late-successional and/or old-growth forests. They focus on the project unit with the objective of reducing the inadvertent loss of undiscovered sites by searching specified potential habitats prior to making decisions about habitat-disturbing activities. They are done according to the Survey Protocol for each species and can use methods such as transects or plots that focus on priority habitats, habitat features, or involve the entire project area. Generally pre-disturbance surveys are only prescribed for species for which they are practical. "Equivalent-effort" surveys are prescribed as a mitigation measure for five Category B mollusk species whose characteristics, such as small size and identifying characteristics, prevent them from being consistently located during site-specific surveys.

Habitat-Disturbing Activities are disturbances likely to have a substantial negative impact on the species' habitat, its life cycle, microclimate, or life support requirements.

Survey Protocols provide guidelines for pre-disturbance surveys. These are interagency documents describing the survey techniques needed to have a reasonable chance of locating the species when it is present on the site, or needed to make an equivalent-effort of locating the species when it is present on the site.

Line officers should seek specialists' recommendations to help determine the need for a survey based on site-specific information.

Pre-disturbance and equivalent-effort surveys are not required for younger stands which have not yet become late-successional and/or old-growth forest. The following definition will be used in making the determination whether a forest stand is late-successional.

> **Late-successional forests** - Forest stands consisting of trees, structural attributes, supporting biological communities, and processes associated with old-growth and/or mature forests (USDA, USDI 1994a). Forest seral stages that include mature and old-growth age classes (USDA, USDI 1994a). Age is not necessarily a defining characteristic but has been used as a proxy or indicator in some usages. Minimum ages are typically 80 to 130 years, more or less, depending on the site quality, species, rate of stand development, and other factors.

Pre-disturbance surveys are not required for wildland fires for resource benefits that take place in congressionally designated Wilderness areas. These are fires that result from natural ignition, such as a lightning strike, and are allowed to burn because they are resulting in resource benefits consistent with pre-approved plans. In this case, pre-disturbance surveys would be impractical given the large area covered and the irregular nature of natural ignitions.

Pre-disturbance surveys are not required in the unusual circumstance that a delay in implementation of the activity (to permit pre-disturbance surveys) would result in greatly increased and unacceptable environmental risk. Such circumstances are subject to review by the REO to ensure the urgency of the activity justifies the risk to species.

Another exception, subject to approval by the line officer at the next level above the official responsible for the proposal, is for wildland fires for resource benefits that are planned in Wilderness Study Areas, roadless areas, and other areas where the objectives are similar to those in Wilderness. Where appropriate, such exceptions are available for Late-Successional Reserves.

Pre-project clearances for special status species would be the same as described under Alternative 2.

Site Management

Known sites are historic and current locations of a species reported by a credible source, available to field offices, and that do not require additional species verification or survey by the Agency to locate the species. Known sites include those sites known prior to the signing of the Northwest Forest Plan Record of Decision (USDA, USDI 1994b), as well as sites found since then. Known sites are typically found during pre-disturbance or strategic surveys.

Known site management for Survey and Manage species would be the same as Alternative 1, except it would only apply to Categories A, B, and E. In addition, exceptions to known site management would be approved by the line officer at the next level above the official responsible for the proposal, as opposed to approval by the REO.

For the uncommon species removed under Alternative 3, existing known sites would no longer be managed and would be made available for multiple use.

For the nine uncommon species that qualify for the Agencies' Special Status Species Programs, site management would be the same as described under Alternative 2.

Conservation Strategies

Conservation strategies for species remaining on Survey and Manage would be the same as described under Alternative 1. Conservation strategies for special status species would be the same as described under Alternative 2.

Inventories

For species remaining in Survey and Manage, inventory will continue through strategic surveys. Strategic surveys are landscape-scale surveys designed to collect information about a species, including its presence and habitat. Information provided by strategic surveys (as well as research and other information-gathering efforts) helps address fundamental questions about Survey and Manage species, including: (1) is there a concern for persistence? (2) is the species closely associated with late-successional forests? (3) what is the appropriate management for the species? and, (4) do the reserve land allocations and other standards and guidelines of the Northwest Forest Plan provide a reasonable assurance of species persistence? Information from strategic surveys is used in the annual species review process and is incorporated into Management Recommendations and Survey Protocols. Strategic surveys are prescribed for all categories. Once strategic surveys have helped answer these questions, or further surveys are not expected to contribute significant additional information, strategic surveys may be complete even if few or no additional sites are found.

Strategic surveys are different from pre-disturbance surveys because they are focused on gathering information about the species and its habitat needs range-wide, and are not focused on determining presence or absence in specific areas prior to habitat-disturbing activities.

Because Category B species are rare and do not have pre-disturbance surveys, completing strategic surveys is a high priority. For this category, the standards and guidelines require: "To reduce the inadvertent loss of undiscovered sites, the Agencies will not sign NEPA decisions or decision documents for habitat-disturbing activities in old-growth forest (a sub-set of late-successional forest - see glossary) in fiscal year 2006 (fiscal year 2011 for fungi) and beyond, unless either:

- "strategic surveys have been completed [as defined in the standards and guidelines] for the province that encompasses the project area, or
- "surveys equivalent to pre-disturbance surveys have been conducted in the old-growth habitat to be disturbed."

Inventory for special status species would be the same as described under Alternative 2.

Adding/Removing Species

For Survey and Manage species, the process for adding or removing them would be the same as described under Alternative 1. For special status species, the process for adding or removing them would be the same as described under Alternative 2.

Reports, Monitoring, and Review

Requirements for reports, monitoring, and review for Survey and Manage species would be the same as described under Alternative 1. Reports, monitoring, and review for special status species would be the same as described for Alternative 2.

Potential Mitigation

Analysis of environmental consequences for Alternative 3 indicates that removal of the Survey and Manage requirements for known site management and/or pre-disturbance surveys would put some species at high risk of extirpation in all or part of their range. In these cases, analysis indicates that mitigation in the form of continued site management and/or pre-project clearances would effectively eliminate the high risk of extirpation (refer to Chapter 3&4).

Alternatives Considered but Eliminated from Detailed Study

An environmental impact statement must rigorously explore and objectively evaluate all reasonable alternatives. The range of alternatives is limited by the requirement to fulfill the Purpose and Need to which the Agencies are responding in proposing the action.

Many of the alternatives considered by the interdisciplinary team were eliminated from detailed study in attempts to find reasonable alternatives that would fulfill the Underlying Need for the Proposed Action and the Purpose of this SEIS. The Purpose and Need, as described in Chapter 1, is the need for "… *healthy forest ecosystems and a sustainable supply of timber and other forest products, to the extent these are frustrated by the Survey and Manage Standards and Guidelines*". This includes purposes to conserve rare and little known species, reduce costs, and improve the Agencies' ability to provide healthy forests and timber outputs. The Purpose and Need substantially limited the range of reasonable alternatives available for analysis and provided a relatively narrow scope for this action. It was not the objective or intent of this SEIS to re-examine the overall strategy of the Northwest Forest Plan.

Among potential alternatives considered were various strategies proposed by the public during the scoping process, as well as some strategies proposed by Agency staff. Some proposals reflected a desire to make fundamental changes in the Northwest Forest Plan, some proposals were technical in nature, and others were based on broad generalizations. Overall, the interdisciplinary team discovered that few strategies were available that would meet the goal of improving the Agencies' ability to meet the underlying needs of the Northwest Forest Plan by addressing the problems associated with the Survey and Manage Standards and Guidelines. Additional alternatives would have been possible if a broader revision of the Northwest Forest Plan had been the objective of this action; however, no such broad revision was deemed necessary to meet the Purpose and Need.

Alternatives considered but eliminated from detailed study are described below.

No Late-Successional and Old-Growth Harvest

This alternative addresses concerns that the proposed action would result in the loss of some late-successional and old-growth forests that are not already protected by the Late-Successional and Riparian Reserves in the Northwest Forest Plan. By prohibiting harvest of these forests, proponents hope to avoid negative impacts to ecological systems and social values like spiritual renewal, scenic beauty, and recreation. This alternative would extend prohibitions on harvest of late-successional and old-growth forests to the remaining 20 percent of federally managed lands not already included in the reserve system in the Northwest Forest Plan. During the scoping process, several variations of this theme were proposed including no old-growth harvest both with

and without the Survey and Manage Standards and Guidelines. Many scoping respondents cited an alternative proposed by the Oregon Natural Resources Council. This variation prohibits late-successional and old-growth harvest, retains the Survey and Manage Standards and Guidelines, and eliminates pre-disturbance survey requirements for some projects.

In 1994, the Northwest Forest Plan Record of Decision (USDA, USDI 1994b) resolved the issue of late-successional and old-growth forest protection through selection of Alternative 9. Alternative 9 allocated about 80 percent of federal lands to reserves, leaving about 20 percent for sustainable timber production. In making that decision, the Secretaries of Agriculture and Interior considered nine other alternatives that included varying levels of late-successional and old-growth forest preservation. In particular, Alternative 1 retained essentially all remaining old-growth and reduced lands available for sustainable timber production to 11 percent (USDA, USDI, 1994a, p. 2-41). Alternative 1 was rejected in the 1994 Record of Decision.

Protecting additional late-successional and old-growth forests outside reserves would be similar to Alternative 1 in the 1994 Final SEIS, and would be akin to expanding the reserve land allocation decision in the 1994 Record of Decision. As previously stated, the Agencies have not identified a need to make changes to the Northwest Forest Plan land allocations. Therefore, any alternative that includes no harvest of late-successional and old-growth forests is considered outside the scope of this proposal.

Keep Survey and Manage for Vertebrate Species Only

The intent of this alternative is to reduce costs by removing all species from the Survey and Manage mitigation measure except for vertebrate species. Some have suggested that only vertebrate species warrant protection because the viability provision in the National Forest Management Act planning regulations at 36 CFR 219.19 refers only to "existing native and desired non-native vertebrate species." This alternative reduces the list of Survey and Manage species from 304 to 6.

This alternative is similar to the proposed action and does not merit further consideration because it would be redundant to the proposed action in terms of environmental consequences. First, under the proposed action, about 94 species would be added to the Agencies' Special Status Species Programs; under this alternative, 89 species would be added. Therefore, effects would only differ from the proposed action for the six species that would be retained in Survey and Manage under this alternative. Second, under Survey and Manage, of these six, all require pre-disturbance surveys in all or part of their range and all but the red tree vole are expected to be added to one or more of the Agencies' Special Status Species Programs. Under those programs, pre-disturbance surveys will also be used where needed or required to assure species persistence. Thus, the only substantial difference between this alternative and the proposed action is in treatment of the red tree vole. Effects of including the red tree vole in Survey and Manage, or not, are already discussed in Chapter 3&4. Repeating that analysis for this alternative would be redundant.

Keep Survey and Manage, Use the Natural Heritage Program Process to Determine which Species to Include

This alternative would use the natural heritage program species ranking process as the basis for determining which species would be subject to the Survey and Manage Standards and Guidelines. Proponents have suggested that this process would remove potential agency bias and result in a more credible Survey and Manage species list. Other elements of the Survey and Manage Standards and Guidelines would remain. Criteria would need to be developed for deciding which species to include in Survey and Manage. Without such criteria, it is impossible to predict exactly which species would be included in Survey and Manage under this alternative.

The natural heritage program ranks species on a scale of 1 to 5: (1) critically imperiled; (2) imperiled; (3) rare, uncommon, or threatened; (4) not rare and apparently secure; and, (5) demonstrably widespread. Rankings are applied at both state and global scales and, as discussed earlier in this chapter, those rankings are used by the Agencies to determine their Special Status Species lists. Under Survey and Manage, there is less concern for persistence of species in the uncommon category than for species in the rare category. This split is similar to the difference between natural heritage ranks 3 and 4 or perhaps 2 and 3. Assuming any Survey and Manage species that ranked 3 or higher on the natural heritage scale were included in Survey and Manage, about 17 species would be removed from Survey and Manage including 10 uncommon species and 7 rare species (all Category B fungi). Assuming all species that ranked 2 or higher would be included in the Survey and Manage mitigation measure, about 47 species would be removed from Survey and Manage including 18 uncommon species and 29 rare species (including 14 Category B fungi). These figures are comparable to Alternative 3 in this SEIS which would remove the 26 uncommon species and 4 arthropod guilds.

In either case, applying criteria to add or remove species from Survey and Manage under this alternative would result in effects similar to either Alternative 1 (No-Action) or Alternative 3 (remove uncommon species). Therefore, analyzing this alternative in detail would be redundant to the analysis for alternatives already considered in detail and will not be studied further.

Eliminate Survey and Manage, Coordinate Agency Policies Regarding Special Status Species Management

This alternative responds to concerns that there are differences in the Agencies' Special Status Species Programs, between the Agencies, between BLM state offices, and between Forest Service regions. Differences in programs can lead to inconsistencies in Special Status Species listings between and within agencies. This alternative is the same as the Proposed Action except it goes further by requiring the Agencies to coordinate their Special Status Species Programs so they are consistent throughout the Northwest Forest Plan area.

Coordinating Special Status Species Programs between agencies already occurs as appropriate. Existing agency policies include guidance aimed at coordinating their respective programs with States and other federal agencies:

- Regional Foresters are responsible for coordinating Regional programs with States, other federal agencies, groups, and individuals concerned with the management of threatened, endangered, and sensitive species (Forest Service Manual 2670.44).
- BLM State directors are responsible for coordinating the special status species program with adjoining BLM State Offices, State, and other federal agencies, various private organizations, and BLM constituents (BLM Manual 6840.04(E)(2)).

The different laws governing the two agencies, and the different habitat capabilities associated with agency lands, explain most of the inconsistencies. While there may be some benefits from additional coordination of Special Status Species Programs between and within agencies, this alternative is outside the scope of this proposal since it involves policies and processes independent of the Northwest Forest Plan. The purpose and need for this proposal is focused on reducing costs and management limitations associated with the Survey and Manage Standards and Guidelines. How the Agencies manage and coordinate their Special Status Species Programs does not address the purpose and need for this proposal. These programs are national in scope and their management and coordination go well beyond the Northwest Forest Plan area. The Proposed Action removes the Survey and Manage Standards and Guidelines and identifies species that are likely to gain Special Species status after they are removed from Survey and Manage. The Agencies have the discretion to add or remove species from their Special Status Species Programs as appropriate. Coordinating such programs is an administrative function; nothing in this proposal prevents the Agencies from coordinating their Special Status Species Programs at any time.

Keep Survey and Manage, Eliminate the Pre-Disturbance Survey Requirement

This alternative seeks to reduce costs by eliminating the requirement for pre-disturbance surveys. All other elements of the Survey and Manage mitigation measure would continue. Of the 304 Survey and Manage species, pre-disturbance surveys apply to 69 species (including 5 receiving equivalent-effort surveys as a mitigation measure). Yet, pre-disturbance surveys are the most expensive mitigation measure in the Survey and Manage Standards and Guidelines and account for about half the cost of the program.

This alternative shares some similarities with Alternative 3, which eliminates pre-disturbance surveys for the nine uncommon species (Category C) and eliminates the pre-disturbance survey requirement for projects in non-late-successional and non-old-growth forest stands. However, it differs in the requirement to survey for the 55 rare species in late-successional and old-growth forest stands. Without this requirement, many species would have a high risk of extirpation. In fact, even if species were to be included as Special Status Species under agency programs as predicted, 19 species (12 mollusks, 2 bryophytes, 3 lichens, 1 mammal, and 1 vascular plant) would be at high risk of extirpation without pre-disturbance surveys. Therefore, eliminating the pre-disturbance requirement in its entirety, would not meet the purpose to conserve rare and little known species and is eliminated from further study.

Keep Survey and Manage, Cut Costs by Exempting Certain Projects

This alternative seeks to reduce Survey and Manage costs by exempting certain projects from requirements for pre-disturbance surveys. All other elements of the Survey and Manage Standards and Guidelines would remain. Examples include no pre-disturbance surveys for precommercial thinning, prescribed fire, or fire salvage projects; low intensity surveys in Matrix and in plantations in Late-Successional Reserves; and no surveys required for stands below specified age limits (e.g. less than 80 years old). This alternative was considered, but eliminated from further consideration because it is similar to Alternative 3. Alternative 3 eliminates requirements for pre-disturbance surveys for projects in non-late-successional and non-old-growth forest stands. All other elements of Survey and Manage would be retained except for the 26 uncommon species and some requirements for REO review. As such, this alternative was considered, but eliminated from detailed study because it would be redundant to the alternatives already considered in detail.

Eliminate Survey and Manage, Keep Strategic Surveys

This alternative would be similar to the Proposed Action except that Strategic Surveys would continue until they were completed. It continues information-gathering through strategic surveys, but eliminates all other elements of Survey and Manage including pre-disturbance surveys and management of known sites. As with the Proposed Action, Survey and Manage species would probably be added to the Agencies' Special Status Species Programs. This alternative was considered, but eliminated from further consideration because it would not meet the purpose of conserving rare and little known species. The effects analysis in this SEIS indicates that 19 species will have a high risk of extirpation if pre-disturbance surveys and management of known sites are eliminated, and an additional 44 species will have a high risk of extirpation if management of known sites is eliminated. Therefore, this alternative would not meet the purpose to conserve rare and little known species and is eliminated from further study.

Stop All Timber Harvest

This alternative prohibits all timber harvest and recommends only custodial management of federal forests in the Northwest Forest Plan area. Prohibiting timber harvest would not fulfill the underlying need because the need for timber outputs would not be met. In addition, fuel treatment projects that include commercial timber harvest would not be undertaken. This would leave many forests at risk of catastrophic wildfire and compromise forest health. This alternative was eliminated because it does not meet the underlying need for the proposal.

Strengthen the Survey and Manage Standards and Guidelines

This alternative would expand the current Survey and Manage Standards and Guidelines by retaining more species in the program, increasing the frequency and intensity of strategic and pre-disturbance surveys, and managing more known sites. This alternative addresses two concerns. First, some feel the current Survey and Manage Standards and Guidelines are a good model for species management and should be expanded to other species. Second, others believe the current Survey and Manage Standards and Guidelines were weakened by the 2001 Record of Decision and need to be restored to the requirements in the 1994 Record of Decision.

Alternative 3 in the Survey and Manage Final SEIS 2000 had objectives similar to this alternative including pre-disturbance surveys for 322 species, and known site management for 346 species. Alternative 3 in the Survey and Manage Final SEIS 2000 would have reduced the PSQ to 455 MMBF per year with a cost of $60 million per year (USDA, USDI 2000a, pp. 417 and 434). The No-Action Alternative in the Survey and Manage Final SEIS 2000 would have maintained a program similar to that in the 1994 Record of Decision, and would also be representative of this alternative. It included pre-disturbance surveys for 87 species and management of known sites for 272 species. The No-Action Alternative in the Survey and Manage Final SEIS 2000 would have reduced the PSQ to 510 MMBF with a cost of $117 million per year (USDA, USDI 2000a, pp. 417 and 434). Analysis for Timber Harvest (Chapter 3&4) indicates that the PSQ under Alternative 1 (No-Action) would be 665 million board feet. Since both Survey and Manage Final SEIS 2000 alternatives would reduce the PSQ well below the 665 MMBF PSQ predicted under Alternative 1, strengthening the Survey and Manage Standards and Guidelines as suggested would fail to meet the underlying need of the proposal to achieve the objectives of the Northwest Forest Plan, in particular, timber outputs. In addition, this alternative would fail to reduce costs below that of the No-Action Alternative ($25.7 million) and fails to meet the purpose to reduce costs. By failing to meet the purpose and need of this proposal, this alternative was eliminated from detailed study.

List Survey and Manage Species under the Endangered Species Act

This alternative moves all Survey and Manage species into threatened or endangered species status under the ESA. This alternative addresses concerns that the Survey and Manage program is flawed and that species would be better conserved through the ESA. There is no evidence suggesting that all Survey and Manage species are at sufficient risk to warrant listing under the ESA.

The Department of the Interior, acting through the FWS, is responsible for protecting most threatened and endangered species. The Department of Commerce, through the NOAA Fisheries, is responsible for marine species, including marine mammals and anadromous fish such as salmon. The process for listing involves a rigorous consideration of rarity, threat, and other factors. Currently, none of the Survey and Manage species are listed as threatened or endangered.

Listing species under the ESA is outside the authority of the Agencies. Threatened and endangered species listing would need to be carried out by the regulatory agencies separate from this SEIS.

Although this alternative eliminates the Survey and Manage Standards and Guidelines, there is no evidence that it would address the purposes of providing protection for rare and little known species while reducing costs and improving the Agencies' ability to accomplish forest health projects. In fact, it is likely that managing 304 species under terms of the ESA would be more costly and time consuming than either the Proposed Action or No-Action Alternatives. Both Survey and Manage and the Special Status Species Programs are designed to prevent species from becoming imperiled to the degree they warrant listing under the ESA. There is no evidence to suggest that these programs are not working as intended. For these reasons, this alternative was eliminated from detailed study.

Eliminate Survey and Manage, Do Not Add Species to Agency Special Status Species Programs

This alternative is similar to Alternative 2, the Proposed Action, except the Agencies would not add Survey and Manage species to their Special Status Species Programs. This alternative would assure the maximum achievement of Northwest Forest Plan resource objectives with little or no cost for species conservation other than for species listed under the ESA. This alternative was not considered in detail because it would be contrary to agency policy that established the Special Status Species Programs and requires their implementation. How the Agencies manage their Special Status Species Programs is outside the scope of this proposal.

Comparison of Alternatives

Tables 2-6 and 2-7 summarize the key features and environmental consequences for all three alternatives in a comparative format. Alternatives differ primarily in the number of species that would be managed under the Survey and Manage Standards and Guidelines versus the Agencies' Special Status Species Programs. The key differences between the current Survey and Manage Standards and Guidelines and the Special Status Species Programs relevant to this analysis are briefly described below:

- Species are included in the Survey and Manage mitigation measure if other elements of the Northwest Forest Plan do not appear to provide for persistence. Rarity or lack of information can lead to a species being included. For the Agencies' Special Status Species Programs, species are generally only included if they are rare, there is enough known about the species and its habitat to affect management, and agency actions would otherwise move the species toward listing under the ESA.

- For the 278 rare species, Survey and Manage requires management of all known sites. Exceptions are permitted following review by the Regional Ecosystem Office (REO). For Special Status Species, final decisions about the management of occupied sites are up to local line officers following analysis documented in a biological evaluation or NEPA document. That analysis can weigh a variety of factors including the condition of the species and habitat locally, the potential short and long-term benefits, and other effects of the proposed management activity.

- Survey and Manage only considers rarity in the Northwest Forest Plan area, and the standards and guidelines only apply to that area. The Agencies' Special Status Species Programs consider the status of the species state-wide and globally, and inclusion of species in one of those programs includes it for the entire state or region, not just the Northwest Forest Plan area. Survey and Manage species with few sites known within the Northwest Forest Plan area

but with extensive sites outside the area may be considered secure and not be included in the Special Status Species Programs.

- The Survey and Manage mitigation measure only focuses on species closely associated with late-successional or old-growth forests because that habitat was decreasing up until the early 1990's when work on the Northwest Forest Plan was begun (such habitat has subsequently increased, see Assumptions and Information Common to All Alternatives sections in Chapter 3&4). Species not closely associated with late-successional or old-growth forests are removed from Survey and Manage and, where they qualify, can be added to the Agencies' Special Status Species Programs. The Special Status Species Programs include species associated with a variety of terrestrial and aquatic habitat types and seral stages.

Finally, there is a difference between the Agencies' Special Status Species Programs and Survey and Manage regarding the taxa potentially included. Before the additional evaluation done for this SEIS, certain taxa groups had not been included in the Agencies' Special Status Species Programs either because of: (1) an absence of perceived threats; (2) the rules embedded in agency regulations and policies pertaining to inclusion of Special Status Species; (3) a lack of sufficient information to evaluate potential management effects; (4) a lack of available agency expertise; (5) absence of heritage rankings; (6) a lack of suitable habitat on agency lands; or, (7) other reasons. For example, the Forest Service in California excludes species about which so little is known that effective surveys and management strategies cannot be designed. And BLM Oregon/Washington maintains a broad list at the state level that can be modified at the District level to exclude species that do not inhabit federally managed lands in the vicinity of the local administrative unit.

Table 2-6. Summary of the key features of the Alternatives.

Feature	Alternative 1	Alternative 2				Alternative 3				
Program	**Survey and Manage**	**BLM Special Status Species**		**FS Sensitive Species**		**Survey and Manage and Special Status Species**				
Program Objectives	Continued persistence of old-growth and late-successional species.	Prevent listing under ESA.		Prevent listing under ESA and maintain viable populations of fish, plants, and wildlife.		For Survey and Manage species, objectives are the same as Alternative 1. For special status species, objectives are the same as Alternative 2				
Agency	All Agencies Survey and Manage	BLM OR/WA[1] SSSP	BLM CA SSSP	FS R-6 SSSP	FS R-5 SSSP	All Agencies SM	BLM OR/WA[1] SSSP	BLM CA[2] SSSP	FS R-6[2] SSSP	FS R-5[2] SSSP
Current # Survey and Manage Species in Program	304 in all or part of range.[2]	26[3]	1[4]	13[5]	6[6]	304	3[3]	0[4]	2[5]	2[6]
Alternative Changes	----	+41	+43	+42	+20	-26	+0	+5	2	+0
Total Species Considered in this SEIS	304	67[7]	44[7]	55[7]	26[7]	278	3[8]	5[8]	5[8]	2[8]
Standards for Inclusion	Northwest Forest Plan area inhabitant, LS/OG related, and *moderate to high concern* for persistence.	Concern for listing and knowledge of decline and threat from state natural heritage programs. Capability to significantly affect the conservation status of the species.		Concern for viability or listing based on current or predicted downward trends in population or habitat capability.		For SM species, must be Northwest Forest Plan area inhabitant, LS/OG related, and *high concern* for persistence. For special status species, same as Alternative 2.				
Species Categories	6 (A-F) based on rarity, uncertainty, and survey practicality.	3: Sensitive, Assessment, Tracking	Sensitive	Sensitive	2: Sensitive and Watch	For SM species: 3 (A, B, E) based on uncertainty and survey practicality. For special status species, same as Alternative 2.				
Project Analysis Requirements	Follow Survey Protocols, Management Recommendations and include in NEPA documents.	Impacts and mitigation considered in NEPA documents.		Analyze effects through BE and recommend mitigation in NEPA documents.		For SM species, same as Alternative 1. For special status species, same as Alternative 2.				

Table 2-6. Summary of the key features of the Alternatives.

Feature	Alternative 1	Alternative 2		Alternative 3
Program	**Survey and Manage**	**BLM Special Status Species**	**FS Sensitive Species**	**Survey and Manage and Special Status Species**
Pre-Project	Pre-disturbance surveys required for 69 species (includes 5 w/equivalent - effort surveys). Exceptions are limited and require REO review.	Multiple sources of survey data are utilized as needed to determine potential impacts. Required for sensitive species in OR/WA BLM.	As needed to conduct BE effects analysis. Usually needed, unless habitat assumed occupied or prior surveys are adequate.	For SM species, pre-disturbance surveys required for 55 species in late-successional/old-growth forest stands. Exceptions are limited and require approval by the line officer at next level above the official responsible for the proposal. For special status species, same as Alternative 2.
Site Management	Manage all Category A, B, and E sites and all high-priority C and D sites, exceptions reviewed by REO.	Manage site if loss would contribute to need to list.	Manage site if loss would create significant trend toward listing or loss of species viability.	For SM species, manage all known sites. Exceptions approved by the line officer at next level above the official responsible for the proposal. For special status species, same as Alternative 2.
Conservation Strategies	Management Recommendations describe managing known sites and guidance for conserving species, including high-priority sites for 27 Category C and D species.	To eliminate the need for listings under the ESA, the BLM shall participate in developing habitat conservation assessments leading to conservation agreements for some species.	Include objectives in LRMPs to ensure viable populations throughout geographic ranges. Develop conservation strategies for sensitive species where continued existence can be negatively affected by the LRMP or a planned project.	For SM species, Management Recommendations describe how to manage known sites and provide guidance for conserving species. For special status species, same as Alternative 2.
Inventory	Strategic surveys required for all species.	Recommended where needed to determine species status on BLM lands. Not required.	Encouraged as needed to support BEs. Not required.	Strategic surveys required for all SM species. For special status, species same as Alternative 2.
Adding/ Removing Species	Annual Species Review includes new information and recommendations for category changes/ additions/deletions. RIEC review required.	Generally bi-annual, when heritage rankings or state lists are updated. State Director authorizes changes/additions/ deletions.	Every 2-3 years in CA. As needed in OR/WA. Regional Forester authorizes changes/additions/deletions.	For SM species, Annual Species Review includes new information and recommendations for category changes/additions/deletions. RIEC review required. For special status species, same as Alternative 2.

Table 2-6. Summary of the key features of the Alternatives.

Feature	Alternative 1	Alternative 2		Alternative 3
Program	**Survey and Manage**	**BLM Special Status Species**	**FS Sensitive Species**	**Survey and Manage and Special Status Species**
Reports, Monitoring, Review	Annual Status Reports required. RIEC/REO review required for most information products. Monitoring in accordance with LRMPs.	Formal reviews/reports not required. Monitor populations and habitats to determine if management objectives are being met. Monitoring in accordance with LRMPs.	Formal reviews/reports not required. Monitoring recommended depending on level of concern. Monitoring in accordance with LRMPs.	For SM species, Annual Status Reports required. RIEC/REO review required for most information products. Monitoring in accordance with LRMPs. For special status, species same as Alternative 2.
Potential Mitigation	None	Continued site management and/or pre-project clearances for species at high risk of extirpation due to Alternative 2.		Continued site management and/or pre-project clearances for species at high risk of extirpation due to Alternative 3.

[1]For comparison purposes, only Bureau Sensitive and Bureau Assessment categories are included for OR/WA BLM.
[2] Does not include the four Arthropod Guilds that are in Survey and Manage.
[3] In 2002 there were a total of 837 "Sensitive" or "Assessment" species on the BLM OR/WA Special Status Species list.
[4] In 2002 there were a total of 456 species on the BLM CA Special Status Species list.
[5] In 2002 there were a total of 489 species on the Forest Service R-6 Sensitive Species list.
[6] In 2002 there were a total of 403 species on the Forest Service R-5 Sensitive Species list.
[7] These numbers do not total 130 because the same species can be included in more then one Agency's SSSP.
[8] These numbers do not total 9 because the same species can be included in more then one Agency's SSSP.

BE = Biological Evaluation
ESA = Endangered Species Act
LRMP=Land and Resource Management Plan
LS/OG = Late-successional and old-growth
REO = Regional Ecosystem Office
RIEC = Regional Interagency Executive Committee
SM = Survey and Manage
SSSP = Special Status Species Programs 1

Table 2-7. Summary of Environmental Consequences. 1

		Alternative 1	Alternative 2		Alternative 3	
			Un-mitigated	Mitigated	Un-mitigated	Mitigated
Species and Guilds	High Risk of Extirpation not due to federal actions [1]	137	137	137	137	137
	High Risk of Extirpation due to actions under the alternative	0	47	0	7	0
	Not at High Risk for Extirpation	141	94	141	133	141
	Insufficient Information to Determine Risk	30	30	30	31	30
Effect on Annual Timber Harvest (MMBF)		-130	-30	-40	-55	-55
Short-term Annual Cost ($ Millions)		$25.9	$7.5	$8.1	$11.8	$11.8
Long-term (10 years) Annual Cost ($ Millions)		$15.3	$7.1	$7.7	$9.2	$9.2
Employment Decrease From Full Harvest Level (per Northwest Forest Plan)		-1,180	-272	-363	-499	-499
Survey Related Employment		+533	+154	+167	+242	+242
Hazardous Fuel Treatment (Annual Acres)		134,100	158,200	156,500	153,500	153,500
Hazardous Fuel Treatment (Cost to Protect Species/Acre)		$134	$39	$44	$52	$52

[1] Factors causing high risk are things such as limited potential habitat and few populations on federal lands, potential for stochastic events, low number of individuals, limited distribution, and narrow ecological amplitudes.

There are no meaningful differences in environmental consequences between alternatives for any of the following environmental components: Aquatic Ecosystem, Late-Successional Forest Ecosystem, Air Quality, Water Quality, Soil Productivity, Threatened and Endangered Species, and Species Associated with Early-Seral Forest.

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
FUNGI						
Acanthophysium farlowii (Aleurodiscus farlowii)		B	T	-	-	-
Albatrellus avellaneus		B	SS	-	SS	-
Albatrellus caeruleoporus		B	T	SS	-	-
Albatrellus ellisii		B	-	-	-	-
Albatrellus flettii, In Washington and California[2]		B	-	-	-	-
Alpova alexsmithii		B	SS	-	-	-
Alpova olivaceotinctus		B	T	-	-	-
Arcangeliella camphorata (*Arcangeliella* sp. nov. #Trappe 12382; *Arcangeliella* sp. nov. #Trappe 12359)		B	SS	-	-	-
Arcangeliella crassa		B	-	-	-	-
Arcangeliella lactarioides		B	T	-	-	-
Asterophora lycoperdoides		B	-	-	-	-
Asterophora parasitica		B	-	-	-	-
Baeospora myriadophylla		B	-	-	-	-
Balsamia nigrens (Balsamia nigra)		B	T	-	-	-
Boletus haematinus		B	-	SS	-	-
Boletus pulcherrimus		B	SS	-	SS	SS
Bondarzewia mesenterica (Bondarzewia montana), In WA and California[2]		B	-	-	-	-
Bridgeoporus nobilissimus (Oxyporus nobilissimus)		A	SS	-	SS	SS
Cantharellus subalbidus, In Washington and California[2]		D	-	-	-	-
Catathelasma ventricosa		B	T	-	-	-
Chalciporus piperatus (*Boletus piperatus*)		D	-	-	-	-
Chamonixia caespitosa (*Chamonixia pacifica* sp. nov. #Trappe #12768)		B	T	-	-	-
Choiromyces alveolatus		B	T	-	-	-
Choiromyces venosus		B	T	SS	-	-
Chroogomphus loculatus		B	SS	-	-	-
Chrysomphalina grossula		B	T	-	-	-
Clavariadelphus ligula		B	-	-	-	-
Clavariadelphus occidentalis (*Clavariadelphus pistillaris*)		B	-	-	-	-
Clavariadelphus sachalinensis		B	T	-	-	-
Clavariadelphus subfastigiatus		B	T	-	-	-
Clavariadelphus truncatus (syn. *Clavariadelphus borealis*)		D	-	-	-	-
Clavulina castanopes v. *lignicola* (*Clavulina ornatipes*)		B	T	SS	-	-
Clitocybe senilis		B	T	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Clitocybe subditopoda		B	T	SS	-	-
Collybia bakerensis		F	-	-	-	-
Collybia racemosa		B	T	SS	-	SS
Cordyceps ophioglossoides		B	T	SS	-	-
Cortinarius barlowensis (syn. *Cortinarius azureus*)		B	T	-	-	-
Cortinarius boulderensis		B	T	-	-	-
Cortinarius cyanites		B	T	-	-	-
Cortinarius depauperatus (*Cortinarius spilomeus*)		B	T	-	-	-
Cortinarius magnivelatus		B	T	-	-	-
Cortinarius olympianus		B	-	-	-	-
Cortinarius speciosissimus (Cortinarius rainierensis)		B	-	-	-	-
Cortinarius tabularis		B	-	-	-	-
Cortinarius umidicola (Cortinarius canabarba)		B	-	-	-	-
Cortinarius valgus		B	T	-	-	-
Cortinarius variipes		B	T	-	-	-
Cortinarius verrucisporus		B	T	-	-	-
Cortinarius wiebeae		B	T	-	-	-
Craterellus tubaeformis (syn. *Cantharellus tubaeformis)*, In Washington and California		D	-	-	-	-
Cudonia monticola		B	T	-	-	SS
Cyphellostereum laeve		B	-	-	-	-
Dermocybe humboldtensis		B	SS	SS	-	-
Destuntzia fusca		B	T	-	-	-
Destuntzia rubra		B	SS	-	-	-
Dichostereum boreale (Dichostereum granulosum)		B	-	-	-	-
Elaphomyces anthracinus		B	T	-	-	-
Elaphomyces subviscidus		B	T	-	-	-
Endogone acrogena		B	-	-	-	-
Endogone oregonensis		B	T	-	-	-
Entoloma nitidum (Rhodocybe nitida)		B	-	SS	-	-
Fayodia bisphaerigera (Fayodia gracilipes)		B	-	-	-	-
Fevansia aurantiaca (Alpova sp. nov. #Trappe 1966) (*Alpova aurantiaca*)		B	T	-	-	-
Galerina atkinsoniana		B	-	-	-	-
Galerina cerina		B	-	-	-	-
Galerina heterocystis		E	-	-	-	-
Galerina sphagnicola		E	-	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Gastroboletus imbellus		B	SS	-	-	-
Gastroboletus ruber		B	T	-	-	-
Gastroboletus subalpinus		B	-	-	-	-
Gastroboletus turbinatus		B	-	-	-	-
Gastroboletus vividus (*Gastroboletus* sp. nov. #Trappe 2897; *Gastroboletus* sp. nov. #Trappe 7515)		B	SS	-	-	-
Gastrosuillus amaranthii (*Gastrosuillus* sp. nov. #Trappe 9608)		E	-	-	-	-
Gastrosuillus umbrinus (*Gastroboletus* sp. nov. #Trappe 7516)		B	-	-	-	-
Gautieria magnicellaris		B	T	-	-	-
Gautieria otthii		B	T	-	-	-
Gelatinodiscus flavidus		B	T	-	-	-
Glomus radiatum		B	T	-	-	-
Gomphus bonarii		B	T	-	-	SS
Gomphus clavatus		F	-	-	-	-
Gomphus kauffmanii		E	T	-	-	-
Gymnomyces abietis (*Gymnomyces* sp. nov. #Trappe 1690, 1706, 1710; *Gymnomyces* sp. nov. #Trappe 4703, 5576; *Gymnomyces* sp. nov. #Trappe 5052; *Gymnomyces* sp. nov. #Trappe 7545; *Martellia* sp. nov. #Trappe 1700; *Martellia* sp. nov. #Trappe 311; *Martellia* sp. nov. #Trappe 5903)		B	-	-	-	-
Gymnomyces nondistincta (*Martellia* sp. nov. #Trappe 649)		B	SS	-	-	-
Gymnopilus punctifolius, In California[2]		B	T	SS	-	-
Gyromitra californica		B	T	-	-	-
Hebeloma olympianum (Hebeloma olympiana)		B	-	-	-	-
Helvella crassitunicata		B	T	-	-	-
Helvella elastica		B	T	-	-	-
Hydnotrya inordinata (*Hydnotrya* sp. nov. #Trappe 787, 792)		B	T	-	-	-
Hydnotrya subnix (Hydnotrya subnix sp. nov. #Trappe 1861)		B	-	-	-	-
Hydropus marginellus (Mycena marginella)		B	T	SS	-	-
Hygrophorus caeruleus		B	T	-	-	-
Hygrophorus karstenii		B	-	-	-	-
Hygrophorus vernalis		B	-	-	-	-
Hypomyces luteovirens		B	T	-	-	-
Leucogaster citrinus		B	T	-	-	-
Leucogaster microsporus		B	T	-	-	-
Macowanites chlorinosmus		B	T	-	-	-
Macowanites lymanensis		B	-	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Macowanites mollis		B	SS	-	-	-
Marasmius applanatipes		B	-	-	-	-
Martellia fragrans		B	SS	-	-	-
Martellia idahoensis		B	SS	-	-	-
Mycena hudsoniana		B	T	-	-	-
Mycena overholtsii		D	-	-	-	-
Mycena quinaultensis		B	T	SS	-	-
Mycena tenax		B	T	-	-	-
Mythicomyces corneipes		B	T	-	-	-
Neolentinus adhaerens		B	-	-	-	-
Neolentinus kauffmanii		B	-	-	-	-
Nivatogastrium nubigenum, In entire range except OR Eastern Cascades and CA Cascades Physiographic Provinces[2]		B	-	-	-	-
Octavianina cyanescens (*Octavianina* sp. nov. #Trappe 7502)		B	T	-	-	-
Octavianina macrospora		B	SS	-	-	-
Octavianina papyracea		B	-	-	-	-
Otidea leporina		D	-	-	-	-
Otidea smithii		B	T	-	SS	SS
Phaeocollybia attenuata		D	T	-	-	-
Phaeocollybia californica		B	SS	SS	SS-O	-
Phaeocollybia dissiliens		B	-	-	SS-O-	-
Phaeocollybia fallax		D	-	-	-	-
Phaeocollybia gregaria		B	SS	-	-	-
Phaeocollybia kauffmanii		D	-	-	-	-
Phaeocollybia olivacea, In Oregon[2]		F	-	SS	-	-
Phaeocollybia olivacea, In Washington and California[2]		E				
Phaeocollybia oregonensis (syn. *Phaeocollybia carmanahensis*)		B	SS	-	-	-
Phaeocollybia piceae		B	T	SS	-	-
Phaeocollybia pseudofestiva		B	T	-	-	-
Phaeocollybia scatesiae		B	-	SS	-	-
Phaeocollybia sipei		B	T	-	-	-
Phaeocollybia spadicea		B	-	SS	-	-
Phellodon atratus (Phellodon atratum)		B	-	-	-	-
Pholiota albivelata		B	T	-	-	-
Podostroma alutaceum		B	T	-	-	-
Polyozellus multiplex		B	-	-	-	-
Pseudaleuria quinaultiana		B	T	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Ramaria abietina		B	T	-	-	-
Ramaria amyloidea		B	T	SS	-	-
Ramaria araiospora		B	-	-	-	-
Ramaria aurantiisiccescens		B	T	SS	-	-
Ramaria botryis var. *aurantiiramosa*		B	T	-	-	-
Ramaria celerivirescens		B	-	-	-	-
Ramaria claviramulata		B	-	-	-	-
Ramaria concolor f. marrii		B	-	-	-	-
Ramaria concolor f. tsugina		B	T	-	-	-
Ramaria conjunctipes var. *sparsiramosa (Ramaria fasciculata* var. *sparsiramosa)*		B	T	-	-	-
Ramaria coulterae		B	T	-	-	-
Ramaria cyaneigranosa		B	-	-	-	-
Ramaria gelatiniaurantia		B	T	-	-	-
Ramaria gracilis		B	T	-	-	-
Ramaria hilaris var. *olympiana*		B	-	-	-	-
Ramaria largentii		B	T	SS	-	-
Ramaria lorithamnus		B	-	-	-	-
Ramaria maculatipes		B	T	-	-	-
Ramaria rainierensis		B	T	-	-	-
Ramaria rubella var. *blanda*		B	T	-	-	-
Ramaria rubribrunnescens		B	T	-	-	-
Ramaria rubrievanescens		B	-	-	-	-
Ramaria rubripermanens, In Oregon[2]		D	-	-	-	-
Ramaria rubripermanens, In Washington and California[2]		B				
Ramaria spinulosa var. *diminutiva* (*Ramaria spinulosa*)		B	SS	-	-	-
Ramaria stuntzii		B	-	-	-	-
Ramaria suecica		B	T	-	-	-
Ramaria thiersii		B	T	-	-	-
Ramaria verlotensis		B	-	-	-	-
Rhizopogon abietis		B	T	-	-	-
Rhizopogon atroviolaceus		B	T	-	-	-
Rhizopogon brunneiniger		B	T	-	-	-
Rhizopogon chamaleontinus (*Rhizopogon* sp. nov. #Trappe 9432)		B	SS	-	-	-
Rhizopogon ellipsosporus (*Alpova* sp. nov. # Trappe 9730)		B	SS	-	-	-
Rhizopogon evadens var. *subalpinus*		B	-	-	-	-
Rhizopogon exiguus		B	SS	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Rhizopogon flavofibrillosus		B	T	-	-	-
Rhizopogon inquinatus		B	T	-	-	-
Rhizopogon truncatus		D	-	-	-	-
Rhodocybe speciosa		B	-	-	-	-
Rickenella swartzii (Rickenella setipes)		B	-	-	-	-
Russula mustelina		B	-	-	-	-
Sarcodon fuscoindicus		B	-	-	-	-
Sedecula pulvinata		B	-	-	-	-
Sowerbyella rhenana (Aleuria rhenana)		B	T	SS	SS-W	SS
Sparassis crispa		D	-	SS	-	-
Spathularia flavida		B	-	SS	-	-
Stagnicola perplexa		B	T	-	-	-
Thaxterogaster pavelekii (*Thaxterogaster* sp. nov. #Trappe 4867, 6242, 7427, 7962, 8520)		B	SS	-	-	-
Tremiscus helvelloides		D	-	-	-	-
Tricholoma venenatum		B	-	-	-	-
Tricholomopsis fulvescens		B	T	-	-	SS
Tuber asa (*Tuber* sp. nov. #Trappe 2302)		B	T	-	-	-
Tuber pacificum (*Tuber* sp. nov. #Trappe 12493)		B	T	-	-	-
Tylopilus porphyrosporus (Tylopilus pseudoscaber)		D	-	-	-	-
LICHENS						
Bryoria pseudocapillaris		A	A	SS	SS	-
Bryoria spiralifera		A	A	SS	SS-O	-
Bryoria subcana		B	A	-	-	-
Buellia oidalea		E	T	-	-	-
Calicium abietinum		B	T	-	-	-
Calicium adspersum		E	A	-	-	SS
Cetrelia cetrarioides		E	T	-	SS-W	-
Chaenotheca chrysocephala		B	-	-	-	-
Chaenotheca ferruginea		B	T	-	-	-
Chaenotheca furfuracea		F	T	SS	-	-
Chaenotheca subroscida		E	T	-	SS	-
Chaenothecopsis pusilla		E	T	-	-	-
Cladonia norvegica		B	T	-	-	-
Collema nigrescens, In WA and OR, except in OR Klamath Physiographic Province[2]		F	-	-	SS-W	-
Dendriscocaulon intricatulum, In California		E	-	SS	SS-W	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Dendriscocaulon intricatulum, In Washington and Oregon except Coos, Curry, Douglas, Josephine, and Jackson Counties[2]		A				
Dermatocarpon luridum		E	T	-	SS	-
Fuscopannaria saubinetii (syn. *Pannaria saubinetii*)		F		-	-	-
Heterodermia sitchensis		E	A	-	-	-
Hypogymnia duplicata		C	T	-	SS-O	-
Hypogymnia vittata (misspelled in FEMAT as *Hygomnia vittiata*)		E	-	-	-	-
Hypotrachyna revoluta		E	A	-	SS	-
Leptogium burnetiae var. *hirsutum*		E	T	-	SS	-
Leptogium cyanescens		A	T	-	SS	-
Leptogium rivale		E	T	-	-	-
Leptogium teretiusculum		E	T	-	-	-
Lobaria linita, Entire range except WA Western Cascades Physiographic Province north of Snoqualmie Pass and Olympic Peninsula[2]		A	A	-	SS-O	-
Lobaria oregana, In California		A	-	SS	-	-
Microcalicium arenarium		B	A	-	-	-
Nephroma bellum, In Oregon: Klamath, Willamette Valley, Eastern Cascades; WA; Western Cascades (outside GPNF), Eastern Cascades, Olympic Peninsula Physiographic Provinces[2]		E	-	SS	SS-W	-
Nephroma isidiosum		E	-	-	-	-
Nephroma occultum		A	T	-	SS-W	-
Niebla cephalota		A	A	SS	SS	-
Pannaria rubiginosa		E	A	SS	SS	-
Peltigera pacifica		E		-	SS	-
Platismatia lacunosa, Except in Oregon Coast Range Physiographic Province[2]		E	T	-	SS-W	-
Pseudocyphellaria perpetua (misapplied name – *P. mougiotiana* in FEMAT and NWFP. Also called *Pseudocyphellaria* sp. 1 in Management Recommendations (Lesher et al. 2000))		B	T	-	-	-
Pseudocyphellaria rainierensis		A	T	-	-	-
Ramalina thrausta		A		-	SS-W	SS
Stenocybe clavata		E	T	-	-	-
Teloschistes flavicans		A	A	SS	SS-O	-
Tholurna dissimilis, south of Columbia River[2]		B	A	-	SS	-
Usnea hesperina		E	T	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

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TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Usnea longissima, In California and in Curry, Josephine, and Jackson Counties, Oregon[2]		A	T	SS	SS	SS
Usnea longissima, In Oregon, except in Curry, Josephine, and Jackson Counties and in Washington[2]		F				
BRYOPHYTES						
Brotherella roellii		E	-	-	-	-
Buxbaumia viridis, In California[2]		E	-	SS	-	
Diplophyllum plicatum		B	A	-	-	-
Herbertus aduncus		E	A	-	-	-
Iwatsukiella leucotricha		B	A	-	SS	-
Kurzia makinoana		B	A	-	-	-
Marsupella emarginata v. aquatica		B	A	-	-	-
Orthodontium gracile		B	A	SS	-	-
Ptilidium californicum, In California[2]		A	-	SS	-	SS
Racomitrium aquaticum		E	T	-	-	-
Rhizomnium nudum, Outside Washington[2]		B	A	-	-	-
Schistostega pennata		A	A	-	SS	-
Tetraphis geniculata		A	A	SS	SS-O	-
Tritomaria exsectiformis		B	A	-	-	-
Tritomaria quinquedentata		B	A	-	-	-
VERTEBRATES						
Larch Mountain salamander *Plethodon larselli*		A	A	-	SS	-
Shasta salamander *Hydromantes shastae*		A	-	SS	-	SS
Siskiyou Mountains salamander *Plethodon stormi*, North Range[2]		D[3]	SS	-	SS-O	SS
Siskiyou Mountains salamander *Plethodon stormi*, South Range[2]		A				
Van Dyke's salamander *Plethodon vandykei*, Cascade population only[2]		A	-	-	SS-W	-
Great Gray Owl *Strix nebulosa*		A	T	-	SS-W	SS
Oregon Red Tree Vole *Arborimus longicaudus*, In Central Range[2]		D[3]	T	-	-	-
Oregon Red Tree Vole *Arborimus longicaudus*, Outside Central Range[2]		C				
MOLLUSKS						
Ancotrema voyanum		E[4,5]		SS	-	-
Cryptomastix devia		A	SS	-	SS	-
Cryptomastix hendersoni		A	SS	-	SS	-
Deroceras hesperium		B[5]	SS	-	-	-
Fluminicola n. sp. 3		A[6]	SS	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Fluminicola n. sp. 11		A[6]	SS	-	-	-
Fluminicola n. sp. 14		A	-	-	-	-
Fluminicola n. sp. 15		A	-	-	-	-
Fluminicola n. sp. 16		A	-	-	-	-
Fluminicola n. sp. 17		A	-	-	-	-
Fluminicola n. sp. 18		A	-	-	-	-
Fluminicola n. sp. 19		A[6]	-	-	-	-
Fluminicola n. sp. 20		A[6]	-	-	-	-
Fluminicola seminalis		A[6]	T	-	-	SS
Helminthoglypta talmadgei		D[3]	-	SS	-	-
Hemphillia burringtoni		E	SS	-	SS-W	-
Hemphillia glandulosa, In WA Western Cascades Physiographic Province[2]		E	T	-	SS-W	-
Hemphillia malonei, In Washington		C	SS	-	SS-W	-
Hemphillia pantherina		B[5]	-	-	-	-
Juga (O) n. sp. 2		A	SS	-	SS-O	-
Juga (O) n. sp. 3		A	-	-	-	-
Lyogyrus n. sp. 1		A	SS	-	-	-
Lyogyrus n. sp. 2		A	SS	-	SS	-
Lyogyrus n. sp. 3		A	-	-	-	-
Megomphix hemphilli, South of south boundary of Lincoln, Benton, and Linn Counties, Oregon[2]		F[7]	T	-	SS	-
Megomphix hemphilli, North of south boundary of Lincoln, Benton, and Linn Counties, Oregon[2]		A				
Monadenia chaceana		B[5]	SS	SS	-	-
Monadenia fidelis minor		A	SS	-	-	-
Monadenia infumata ochromphalus (Monadenia fidelis klamathica, Monadenia fidelis ochromphalus)		B[4,5]	-	-	-	-
Monadenia troglodytes troglodytes		A	-	-	-	SS
Monadenia troglodytes wintu		A	-	-	-	SS
Oreohelix n. sp.		A	-	-	SS-W	-
Pristoloma arcticum crateris		A[6]	SS	-	-	-
Prophysaon coeruleum, In California and Washington[2]		A	-	-	SS-W	-
Trilobopsis roperi		A	-	-	-	SS
Trilobopsis tehamana		A	-	SS	-	SS
Vertigo n. sp.		A	-	-	-	-
Vespericola pressleyi		A	-	-	-	-

Table 2-8. Survey and Manage Categories and Probable Special Status Species Program Assignments by Agency and Region.

Special Status Species: SS=Bureau Sensitive or Forest Service Sensitive; A=Bureau Assessment; T=Bureau Tracking; SS-O=FS Sensitive in Oregon; SS-W=FS Sensitive in Washington. Hyphens (-) indicate not included, may result from species not occurring in the state.		**Survey and Manage**	**Special Status Species Programs-** *Note: Based on ONHP rankings. Subject to change in Final SEIS.*			
TAXA GROUP ***Species***	*Note: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in NWFP (Table C-3).*	**Cate-gory**	**BLM OR/ WA[1]**	**BLM CA**	**FS R-6**	**FS R-5**
Vespericola shasta		A	-	-	-	SS
Vorticifex n. sp. 1		E	-	-	-	-
VASCULAR PLANTS						
Arceuthobium tsugense mertensianae, In Washington only		F	-	-	-	-
Bensoniella oregana, In California only[2]		A	SS	-	SS-O	SS
Botrychium minganense, In Oregon and California		A	T	-	SS-O	SS
Botrychium montanum		A	A	-	SS-O	SS
Coptis asplenifolia		A	-	-	SS-W	-
Coptis trifolia		A	A	-	SS	-
Corydalis aquae-gelidae		A	SS	-	SS	-
Cypripedium fasciculatum, Entire Range except WA Eastern Cascades Physiographic Province[2]		C	A	SS	SS	SS
Cypripedium montanum, Entire range except WA Eastern Cascades Physiographic Province[2]		C	T	SS	-	SS
Eucephalus vialis (Aster vialis)		A	SS	-	SS-O	-
Galium kamtschaticum, Olympic Peninsula, WA Eastern Cascades, OR and WA Western Cascades Physiographic Provinces, south of Snoqualmie Pass[2]		A	-	-	SS	-
Platanthera orbiculata var. *orbiculata* (*Habenaria orbiculata*)		C	-	-	-	-
ARTHROPODS						
Canopy herbivores (south range)		F	-	-	-	-
Coarse wood chewers (south range)		F	-	-	-	-
Litter and soil dwelling species (south range)		F	-	-	-	-
Understory and forest gap herbivores (south range)		F	-	-	-	-

[1]BLM OR/WA list is inclusive of any Oregon Natural Heritage Program List 1 through 4 species and is not screened 1 at the state level. Screening occurs at the field level pending local capability to significantly affect conservation status 1 and whether the species is documented or suspected to inhabit BLM administered lands.
[2]Geographic limitations included with the species names applies to Survey and Manage only. Special Status Species 1 Program placements apply to entire states.
[3]Although pre-disturbance surveys are deemed practical for these four species, continuing pre-disturbance surveys is 1 not necessary to meet management objectives. 1
[4]Until Management Recommendations are written, the language known and newly discovered sites of these species 1 will be protected from grazing by all practical steps to ensure that the local population of the species will not be 1 impacted is the Management Recommendation. No other recommendations are imposed at this time. 1
[5] Equivalent-effort pre-disturbance surveys are required for these mollusk species.
[6]Until Management Recommendations are written: known and newly discovered sites will be protected from 1 grazing by all practical steps to ensure that the local population of the species will not be impacted. 1
[7]This mollusk species requires management of sites known as of 9/30/99. 1

Chapter 3&4 - Affected Environment and Environmental Consequences

Introduction

Chapter 3 (Affected Environment) and Chapter 4 (Environmental Consequences) are combined in this document, as was done in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a), to more clearly present information to the readers. The text is ordered by first describing a resource or environmental component, and then describing the environmental consequences to that resource or component.

This chapter describes aspects of the environment likely to be most directly affected by the proposed management. Also described are the direct and indirect effects (or impacts) of management under the alternatives, which constitutes presentation of cumulative impacts. Together, these form the scientific and analytic basis for the Comparison of Effects of the Alternatives section in Chapter 2. Additional information regarding the existing environment may be found in the Survey and Manage Final SEIS 2000.

Relationship of this SEIS to the Northwest Forest Plan Final SEIS and the 2000 Survey and Manage Final SEIS

This SEIS supplements the 2000 Survey and Manage Final SEIS. Whenever a broad environmental impact statement has been prepared and a subsequent environmental impact statement is then prepared on an action within the entire program, the subsequent environmental impact statement need only summarize the issues discussed in the broader environmental impact statement and incorporate by reference the discussions from the broader statement (40 CFR 1502.20). Additional information is incorporated by reference from Forest Ecosystem Management: An Ecological, Economic, and Social Assessment; Report of the Forest Ecosystem Management Assessment Team (FEMAT) 1993, the Northwest Forest Plan Final SEIS 1994, and the 2001 and 2002 Annual Species Review of Survey and Manage species.

In summary, the information used to describe the affected environment and environmental consequences in Chapter 3&4 in this SEIS was largely compiled or derived from:

- FEMAT 1993,
- Northwest Forest Plan Final SEIS 1994, Chapter 3&4 and Appendix J2,
- Survey and Manage Final SEIS 2000, Chapter 3&4, and
- 2001 and 2002 Annual Species Review.

The analysis of environmental consequences of Alternative 1 in the Survey and Manage Final SEIS (November 2000) is the analytical equivalent of Alternative 1 in this SEIS.

The analyses of environmental consequences of Option 9 in FEMAT and the assessment ratings in Alternative 9 in the Northwest Forest Plan Final SEIS did not include the Survey and Manage Standards and Guidelines; therefore, Option 9 and Alternative 9 are approximate analytical equivalents to Alternative 2. In addition to the Survey and Manage mitigation measure, the analysis of Option 9 in FEMAT and Alternative 9 in the Northwest Forest Plan Final SEIS did not include seven other mitigation measures that were added late in the process.

Alternative 3 combines some elements of Alternative 1 with some elements of Alternative 2. As a result, much of the analysis of Alternative 3 can be interpolated from the analysis of Alternatives 1 and 2.

The analysis of environmental consequences in this SEIS is limited to those that would result from the actions described in the alternatives. The alternatives in this SEIS have already been thoroughly analyzed in FEMAT, the Northwest Forest Plan Final SEIS, and the Survey and Manage Final SEIS 2000. Because there is no new information that would substantially change the conclusions provided in these earlier documents, the conclusions are still relevant.

The environmental consequences described in the Northwest Forest Plan Final SEIS relating to other aspects and elements of the Northwest Forest Plan, which are unchanged by the alternatives in this SEIS, are assumed to remain valid.

Incomplete or Unavailable Information

The management of natural resources and the analysis in the Northwest Forest Plan Final SEIS were surrounded by public and scientific controversy. The Northwest Forest Plan Final SEIS acknowledged this controversy. The public and scientific controversy concerning natural resource management in the Pacific Northwest has continued to the present time. Additionally, the amount of information available for description and analysis varies greatly by species and taxa managed under the Survey and Manage Standards and Guidelines.

One step in preparing an environmental impact statement is to evaluate whether information about effects of a proposed action is incomplete or unavailable and, if so, to disclose that fact and make certain findings about the relevance, importance, and/or costs of acquiring data that could help fill any such gaps. Much of the discussion concerning these issues in the 1994 Northwest Forest Plan Final SEIS (pp. 3&4-3 and 3&4-4) and the 2000 Survey and Manage Final SEIS (pp. 180-182) remains relevant for purposes of the analysis in this SEIS and is specifically tiered to and incorporated by reference.

When encountering a gap in information, the question implicit in the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(a)) on incomplete or unavailable information was posed: Is this information "essential to a reasoned choice among alternatives?" While additional information would often add precision to estimates, the basic data and central relationships are sufficiently well established that any new information would not likely reverse or nullify relationships. Though new information would be welcome, no missing information is essential to a reasoned choice among the alternatives.

As noted throughout the species analyses in this SEIS, there is much that remains unknown about many of the species subject to analysis. Although some species are thought to be closely associated with late-successional and old-growth forests, for some species, the strength of this association is not well known. In addition, connectivity and habitat needs, range, and other specific information for many species are unknown or uncertain. Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small

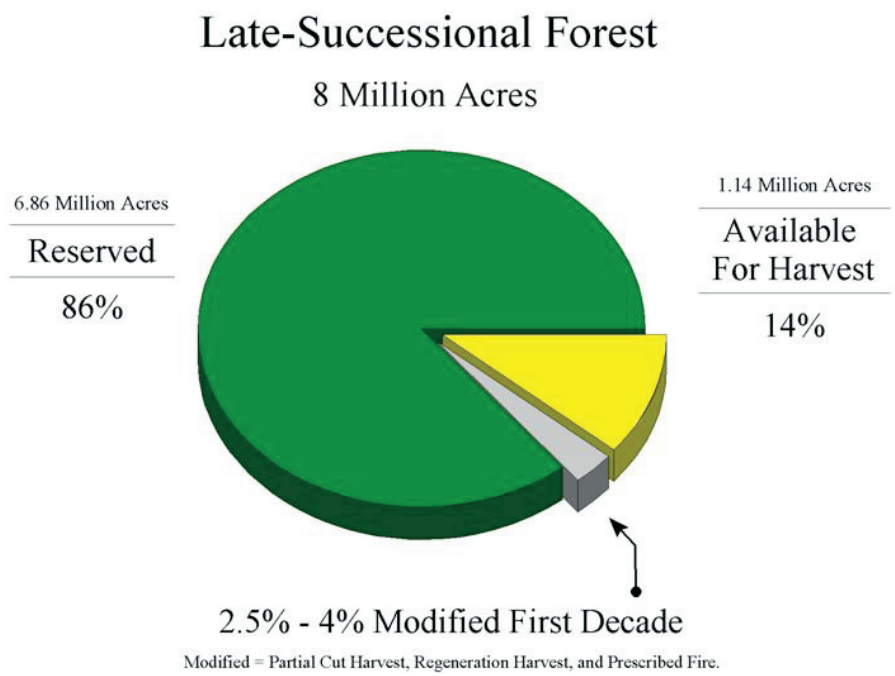
percentage of potential habitat has been surveyed. In situations where limited species-specific information is available, more reliance, by necessity, must be placed on information regarding the condition and management of the overall landscape in formulating conclusions regarding environmental consequences. The best available information was used to evaluate the alternatives.

Assumptions and Information Common to All Alternatives

Conclusions regarding the environmental consequences of the alternatives are based on specific species information, information about the landscape, and assumptions regarding management actions. Information and assumptions common to all alternatives are:

- The Northwest Forest Plan incorporates conservation principles of maintaining: (1) connectivity across the landscape; (2) landscape heterogeneity; (3) structural complexity; and, (4) the integrity of aquatic systems;
- 80 percent of the Northwest Forest Plan area is reserved (see Figure 3&4-3);
- 86 percent of late-successional forest is reserved (see Figure 3&4-1);
- Less than 4 percent of late-successional forest will be disturbed by management per decade;
- Development of late-successional forest is 2.5 times the rate of loss through stand replacement fire and harvest (see Figure 3&4-2);
- Under the Northwest Forest Plan, there is a 600,000-acre net increase in late-successional forest per decade and a 2.7 million-acre net increase in late-successional forest over 3-4 decades;
- A system of riparian reserves comprise on average approximately 50 percent of every watershed;

Figure 3&4-1. Late-Successional Forest in the Northwest Forest Plan Area.



- Matrix management provides for retention of old-growth components (e.g., green tree, snag , and down woody debris) and provides for a broad range of age classes; and
- The Northwest Forest Plan Final SEIS and FEMAT concluded the plan would provide for maintenance and restoration of a functional and interconnected late-successional forest ecosystem.

Of the 24.5 million acres under the Northwest Forest Plan, 8 million acres are late-successional forest. The existing distribution and spatial patterns of this late-successional forest are the result of past land management activities, natural disturbances, and the land allocations designated prior to the Northwest Forest Plan. The land allocations and associated standards and guidelines of the Northwest Forest Plan provided a new direction for retention, protection, and development of late-successional forest.

- Reserves - Congressionally Reserved, Late-Successional Reserves, Administratively Withdrawn Areas, and Riparian Reserves encompass 86 percent (6.8 million acres) of the existing late-successional forest. The objectives of these reserves are to provide for protection and development of late-successional forest.
- Matrix and Adaptive Management Areas - 1.1 million acres or 14 percent of the existing late-successional forest is assumed to be available for harvest within the Matrix and Adaptive Management Areas in support of the Probable Sale Quantity (PSQ) objectives of the plan.
  - › Matrix management activities, including regeneration harvest, partial cut harvest, and prescribed fire, will modify 2.5-4 percent of the existing and late-successional forest over a decade (see Figure 3&4-1).[1]
  - › Matrix Standards and Guidelines provide for retention of legacy elements of late-successional forest after harvest such as snags, green trees, and down logs. There are also provisions that provide protection of all late-successional forest in watersheds where little remains.
  - › The lands available for harvest in the Matrix contain all seral stages. The management of some of these lands, particularly in the southern half of the Northwest Forest Plan, is under longer rotations and partial cut regimes which will maintain some forest in older stages of stand development at all times.

Development of Late-Successional Forest in the Future

Under the assumptions of the Northwest Forest Plan, the existing 1.1 million acres of late-successional forest in the Matrix and Adaptive Management Areas would be harvested over the next 40 to 50 years. During this same timeframe, with the Northwest Forest Plan assumptions for harvest and stand replacement fire, it is estimated the overall amount of late-successional forest will increase by 2.7 million acres due to the development of late-successional forest in reserves. This development of forest over time occurs across the full spectrum of late-successional forests, including old growth. Late-successional forest is increasing at 2.5 times the rate of loss through stand replacement fire and harvest.

Late-Successional Reserves - Late-Successional Reserves were designed around the most ecologically significant existing late-successional forest. Late-Successional Reserves and Congressionally Reserved Areas provide for 60 percent of federal lands in large block reserves. The forested portions of these reserves are being managed for the creation of large blocks of late-successional forest habitat. Late-Successional Reserves were also designated around Known Spotted Owl Activity Centers and Occupied Marbled Murrelet Sites. These Late-Successional Reserves provide additional protection of the late-successional forest associated with these sites.

Administratively Withdrawn Areas - The current land and resource management plans have administratively withdrawn an additional 6 percent of federal lands which protect and preserve existing resource values. Most of these areas contain late-successional forest. Examples of administratively withdrawn areas are Research Natural Areas, Areas of Critical Environmental

[1] The Northwest Forest Plan Biological Opinion assumed that 2.5 percent of existing owl habitat will be removed as suitable habitat through timber harvest. Figure 3&4-1 differs from the Biological Opinion assumption in that it displays late-successional forest which is broader than owl habitat. The 2.5- 4 percent is "modified" not "removed" by activities such as prescribed fire, partial cuts, and forest health treatments as well as regeneration harvest.

Figure 3&4-2. Development of Late-Successional Forest Over Time.

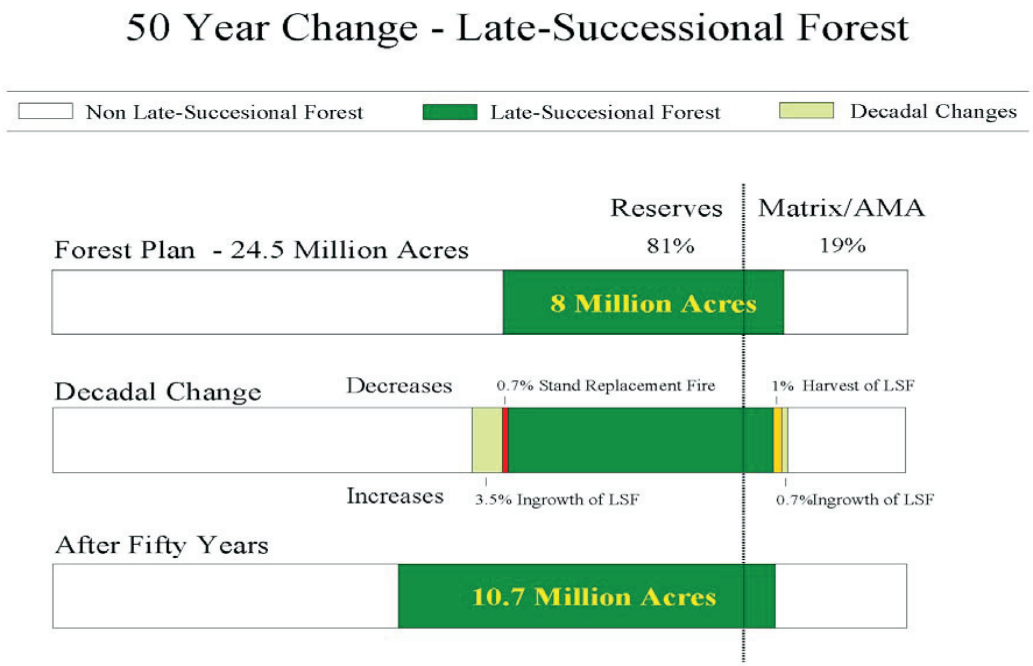
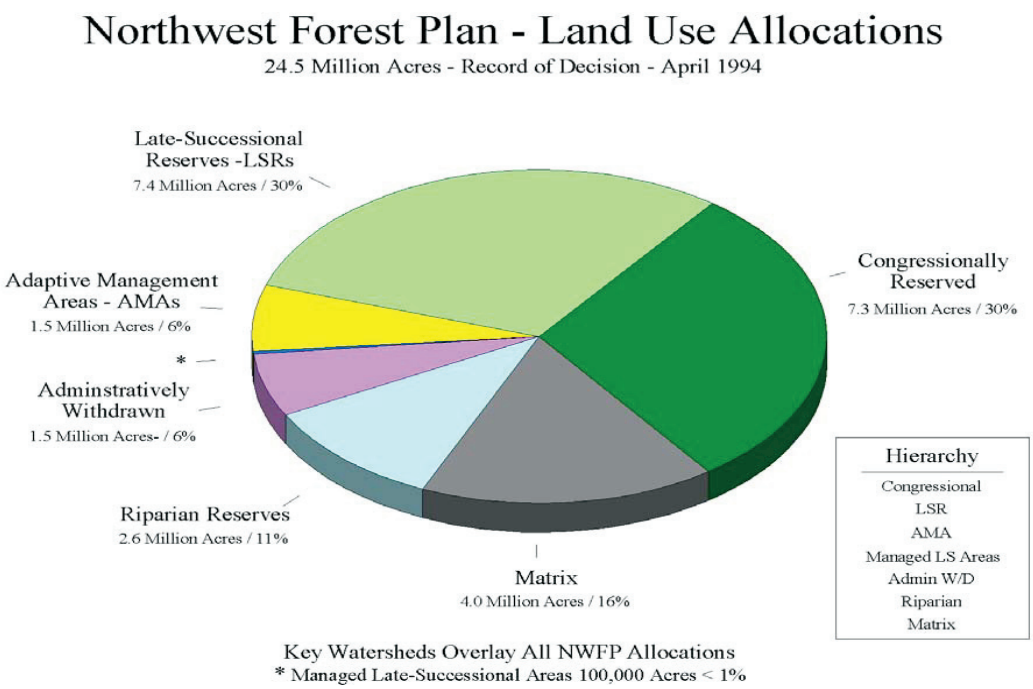


Figure 3&4-3. Northwest Forest Plan Land Allocations and Late-Successional Forest.



Concern, Scenic areas, fragile sites not suitable for long-term timber production, unique habitat areas (caves, meadows, wetlands, etc.), recreation areas, and wildlife management areas (eagles, peregrine falcon, etc).

Riparian Reserves - The Riparian Reserve network adopted under the Northwest Forest Plan was the most extensive among the alternatives considered. In 1994, the Riparian Reserves were estimated to encompass 11 percent of federal lands. Since 1994, revised estimates have indicated at least an additional 2 percent of the federal lands are in Riparian Reserves. This reserve component spans the full range of forest conditions including late-successional forest and provides reserve lands intermingled throughout the Matrix lands. These lands are being managed to develop and protect late-successional forest.

New Information

One of the primary events that have taken place since the 2000 Survey and Manage Final SEIS is the occurrence of wildfire. In the summer of 2002, wildfires burned many acres of federal forests within the Northwest Forest Plan area. Fires burned with varying degrees of intensity. Low-intensity, ground fires consumed light fuels while leaving much of the forest structure intact. Other forested areas were completely consumed in high-intensity, stand-replacing fires. Effects to Survey and Manage species probably varied with the intensity of the fires. Generalizations regarding the effects of wildfire cannot be made. Some species that depend on fire probably benefited while others that do not tolerate fire may have been killed or displaced. However, it is important to recognize that late-successional forests in the planning area are dynamic and have historically experienced varying levels of disturbance from fire, windstorms, insects, and disease. Survey and Manage species have evolved within this ecosystem. There is no information that indicates that the fires of 2002 are inconsistent with assumptions made in the Northwest Forest Plan Final SEIS 1994 (see Wildland and Prescribed Fire section, this chapter).

Information has been gained from surveys and other sources which was used to update the Interagency Species Management System (ISMS) database. Current federal known extant sites from ISMS are displayed in Table 3&4-1 at the end of this chapter.

Under the Survey and Manage Standards and Guidelines, an annual species review is completed. A regional-level interagency group including taxa experts weighs new information against criteria to determine if additions or deletions of species from Survey and Manage or changes of species among categories are warranted. A complete summary for this process can be found in the Survey and Manage Final SEIS 2000, Appendix F. The first annual species review as prescribed by the Survey and Manage Record of Decision (January 2001) was completed in June 2002. The second annual species review was completed in March 2003. The following changes were made based on these reviews:

- 50 species were removed from Survey and Manage in all or part of their range;
- 59 species were placed in different categories for all or part of their range;
- 25 species had their ranges changed.

The 50 species removed during the two annual species reviews are not analyzed in this SEIS because they are no longer included in the Survey and Manage Standards and Guidelines. The annual species reviews determined, in some instances, new information warranted a change in the category of a species but not its removal from the Survey and Manage Standards and Guidelines. The change in the category of a species under Survey and Manage is considered a refinement of management.

Monitoring of the Northwest Forest Plan has indicated the Agencies have a high degree of fidelity in implementing the standards and guidelines as written. The 2001 field season marked the sixth consecutive year of the Northwest Forest Plan implementation monitoring program. This program is designed to determine whether the Record of Decision and its corresponding standards and

guidelines are consistently followed across the Northwest Forest Plan area. Overall, compliance in meeting the Northwest Forest Plan Standards and Guidelines was 98 percent for the 21 projects and watersheds monitored in 2001 (USDA et al. 2002). The assumed level of timber sales under the Northwest Forest Plan has not been achieved for a variety of reasons including greater than anticipated effects from the Survey and Manage Standards and Guidelines and lawsuits.

It is important to understand the relationship of monitoring and information to mitigation. New information is always welcome and often facilitates decision-making and adaptive management. Additional information may allow a more accurate management of risk. Monitoring is often an important source of new information. Although monitoring and gaining new and additional information are important, they are not mitigation measures that reduce environmental consequences of management actions. For instance, monitoring or completing research on water temperature would not mitigate a management action that removed shade from streams. Gaining new information can aid the adaptive management process, but it does not predetermine what specific management decisions will be taken in response to that information. New information does not have a direct mitigating effect on the environmental consequences of management actions.

Both the Survey and Manage Standards and Guidelines and the Special Status Species Programs have mechanisms to obtain new information. The Survey and Manage Standards and Guidelines, however, have a more intensive strategy to accomplish information gathering. If new information, in general, facilitates decision-making and adaptive management, then the Survey and Manage Standards and Guidelines should be more facilitative of decision-making and adaptive management than the Special Status Species Programs. It is not possible to attribute a reduction of specific environmental consequences from information gathering and the facilitation of adaptive management. Even though a direct link to environmental consequences is not attributable to information gathering and monitoring, these are the basis of adaptive management and informed decision making.

The compilation of new information in the Survey and Manage Final SEIS 2000 (pp. 183-187) is incorporated by reference.

Adaptive Management

The Northwest Forest Plan requires adaptive management. Adaptive management is a continuing process of action-based planning, monitoring, researching, evaluating, and adjusting with the objective of improving the implementation and achieving the goals of the selected alternative. Under the concept of adaptive management, new information will be evaluated and a decision will be made whether to make adjustments. Each alternative provides for acquiring and utilizing additional information to improve management direction for species. Alternatives 1 and 3 prescribe strategic surveys to obtain new information and the annual species review process to evaluate new information relating to species currently included in the Survey and Manage Standards and Guidelines. For all alternatives, the Agencies' Species Status Species Programs also provide for evaluation of new information regarding species.

Cumulative Impacts

Cumulative impacts to the environment are defined in the CEQ regulations as those that result from the incremental effects of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes them (40 CFR 1508.7). Given the programmatic nature and scale of this SEIS, most of the environmental consequences discussed represent a general projection of the accumulated effects of management actions that are reasonably assumed to occur given the current status of federally managed lands and the full complement of the Northwest Forest Plan Standards and Guidelines.

The cumulative effects analysis in Chapter 3&4 of the Northwest Forest Plan Final SEIS, including Appendix J2, and the 2000 Survey and Manage Final SEIS, addressed in detail the cumulative effects relating to species that are the subject of the analysis in this SEIS. The extensive cumulative effects analysis in these documents, as well as that contained in FEMAT, is incorporated by reference in this SEIS. The environmental consequences analysis and conclusions of this SEIS has considered new information while compiling and deriving information from these documents.

Background for Effects Analysis

The information used to describe the affected environment and environmental consequences in Chapter 3&4 in this SEIS was, with consideration of new information, compiled or derived from FEMAT, the Northwest Forest Plan Final SEIS Chapter 3&4, including Appendix J2, the 2000 Survey and Manage Final SEIS, and the 2001 and 2002 Annual Species Reviews.

The analysis of environmental consequences in this SEIS must be understood in the context of the overall Northwest Forest Plan. The Northwest Forest Plan is an ecosystem approach to land management that focuses on habitat for late-successional and old-growth forest related species. Overall, environmental consequences cannot be attributed to a single set of standards and guidelines, such as Survey and Manage. The overall strategy in the Northwest Forest Plan is comprised of a combination of seven different land allocations and many different standards and guidelines.

The Survey and Manage Standards and Guidelines were a mitigation measure added to Alternative 9 in the Northwest Forest Plan Final SEIS and adopted in its Record of Decision. This mitigation measure was included to help improve the distribution and stability and to decrease the likelihood of extirpation of little known species that were thought to be rare.

A brief summary of the analyses provided in FEMAT, the Northwest Forest Plan Final SEIS (including Appendix J2), and the Survey and Manage Final SEIS 2000 is included here to help the reader understand the approach taken for the effects analysis in this SEIS.

FEMAT

The Forest Ecosystem Management Assessment Team was commissioned in 1993 to formulate and assess options for managing Forest Service and BLM administered lands within the range of the northern spotted owl. Of 64 options considered by FEMAT, 10 options encompassing various mixes of Late-Successional Reserves, Riparian Reserves, and prescriptions for management of forests both inside and outside of these reserves were selected for full development and analysis. In Late-Successional and Riparian Reserves, standards and guidelines were designed to restore and maintain late-successional forests and to maintain natural ecosystem processes. In the Matrix (areas outside of reserves), standards and guidelines were designed to provide connectivity between reserves and provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees. The Matrix was also expected to provide for ecologically diverse early-successional conditions and planned timber harvest.

For each of the ten options, the team evaluated the likelihood of maintaining well-distributed habitat conditions on federally managed lands for threatened marbled murrelets and northern spotted owls. In addition, for 7 of the options, similar assessments were done for more than 1,000 plant and animal species thought to be closely associated with late-successional forests. In keeping with agency responsibilities to prevent species from being listed under the Endangered Species Act (ESA) and with the regulations issued pursuant to the National Forest Management Act (NFMA), the team assessed the risk of “viability” to species.

Panels of experts were convened to make a determination of the likelihood of achieving four possible outcomes as it related to habitat conditions on federal lands for each species. Panelists were asked to assign 100 "likelihood votes" (or points) across four outcomes. A panelist could express complete certainty in a single outcome for a species/option combination by allocating 100 points to a single outcome. The panelist could express uncertainty by spreading votes across the outcomes. Following are the four outcomes:

Outcome A: Habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize, well distributed across federal lands. (Note: the concept of well distributed was to be based on knowledge of the species distribution, range, and life history.)

Outcome B: Habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize, but with significant gaps in the historic species distribution on federal land. These gaps can cause some limitation in interactions among local populations. (Note: the significance of the gaps must be judged relative to the species distribution, range, and life history, and the concept of metapopulations.)

Outcome C: Habitat only allows continued species existence in refugia, with strong limitations on interactions among local populations.

Outcome D: Habitat is inadequate to maintain the species and would result in species extirpation from federal land within the range of the northern spotted owl.

While the use of a "point" system implies a certain precision, the ratings were compilations of subjective ratings by numerous scientists. Although the overall evaluation may have been reasonable, the ratings are not precise and the ratings are conservative for many rare species. The following areas, which are relevant to the assessment of rare species, were subject to different interpretations by different panels.

1. Treatment for rare and locally endemic species. Many of these species had small and restricted ranges or existed in refugia even before habitat alteration by harvesting and other activities. Some panelists tended to rate these species in Outcome B or C under even the most protective options (USDA, USDI 1994a, p. 3&4-122).
2. Habitat versus population outcomes. Outcomes were defined in terms of habitat "quality, distribution, and abundance." Some panelists found it difficult to separate the habitat and population elements (USDA, USDI 1994a, p. 3&4-122).
3. Definition of "well distributed." Panelists were not uniformly clear about what "well distributed" meant for each taxon. This issue was particularly confusing between Outcome A and B (USDA, USDI 1994a, p. 3&4-123).
4. Historic versus current species distribution. Reference in the scale to "historic species distribution" in Outcome A was difficult for species groups for which information is limited to the current distribution. Taken literally, the reference to historic distribution held the ratings to a high standard of requiring habitat reestablishment throughout the historic range (USDA, USDI 1994a, p. 3&4-123).
5. It was difficult for panelists to project changes in biophysical conditions over the 100-year timeframe specified (FEMAT, pp. IV-42 through IV-43 and USDA, USDI 1994a, p. 3&4-123).

FEMAT compared outcomes of the options on species viability by assessing whether the scientists believed that under the alternative being evaluated, a vertebrate species had an 80 percent or greater likelihood of achieving Outcome A. In focusing on the 80 percent likelihood of achieving Outcome A, FEMAT did not suggest that only options attaining that likelihood satisfied the viability provision. FEMAT specifically noted that no single such level represents a viable population for all species and circumstances. The 80 percent level was chosen only as a point of comparison (FEMAT, p. IV-49). The 80 percent level was later selected as a "screen" which triggered additional species review during preparation of the Northwest Forest Plan Final SEIS.

The analysis by FEMAT was limited to assessing the sufficiency of habitat. It did not assess population viability per se. The team did note, for some species, continued persistence was in question regardless of federal land management. A system of Late-Successional Reserves was the central feature of all the options considered. The extent of the reserve system (i.e. total acreage) was the single most distinguishing feature across the array of options.

Late in the Northwest Forest Plan Final SEIS process, eight mitigation measures were added to Alternative 9, including Survey and Manage and Riparian Reserve Scenario 1 (one site-potential tree height width reserve on either side of intermittent streams) which greatly increased the amount of forest protected in riparian areas within the Matrix. The panels and assessments were not repeated to determine if the additional protections would have caused a different outcome.

Northwest Forest Plan Final SEIS including Appendix J2 (Results of Additional Species Analysis)

Using the FEMAT report, the Northwest Forest Plan SEIS team prepared a Supplemental EIS using FEMAT's 10 options as alternatives. The 1994 Record of Decision selected Alternative 9 as the alternative that best met the dual needs: the need for forest habitat and the need for forest products.

Additional species analysis was completed between the Northwest Forest Plan Draft and Final SEISs. Species were screened for the necessity of further analysis if, for vertebrates, there was a likelihood of Outcome A of less than 80 percent or any percent likelihood of Outcome D. For all other taxa, the screen was a combined likelihood of Outcome C and D of 20 percent or more, or any percent likelihood of Outcome D. The screening levels were not intended to represent a judgment of what is required by either the NFMA or the ESA (USDA, USDI 1994, Appendix J2, p. J2-2). The additional species analysis is described in detail in Appendix J2 of the Northwest Forest Plan Final SEIS.

The additional species analysis process in the Northwest Forest Plan Final SEIS considered 23 additional mitigation measures, including Survey and Manage, which might improve the ratings for the species that did not pass the screen. Eight of the 23 mitigation measures were incorporated into Alternative 9 and were adopted in the Northwest Forest Plan Record of Decision. Chapter 3&4 of the Final SEIS contained general statements that the additional standards and guidelines resulting from the added mitigation provided increased habitat protection for some species; however, the analysis and ratings for species were never changed to reflect the added mitigation. The overall assessment of maintenance of a functional and interconnected late-successional forest ecosystem in the Final SEIS was not revised to reflect the additional mitigations because it was anticipated that the changes to the outcomes were expected to be relatively minor.

Because the assessments of Alternative 9 were not updated to include the Survey and Manage Standards and Guidelines, it is possible to use Alternative 9 as the approximate analytical equivalent to Alternative 2 in this SEIS.

After a species was screened for additional analysis in the Northwest Forest Plan Final SEIS, the thresholds by which it was screened for additional analysis (see explanation above) were used in evaluating the benefits of proposed mitigation (USDA, USDI 1994a, p. J2-57). Although it was stated that the screening levels did not represent a judgment as to what is required by either the NFMA or the ESA (USDA, USDI 1994a, Appendix J2, p. J2-2), it is easy to confuse the screen thresholds with targets that must be met. This SEIS does not adopt any specific level of likelihood of Outcomes A, B, C, or D from the additional species analysis as representing a threshold of reasonable certainty to support a conclusion regarding environmental consequences.

Survey and Manage Final SEIS 2000

In 1998, the Secretaries of Agriculture and Interior determined the Survey and Manage mitigation measures added to Alternative 9 as a result of the additional species review needed to be revised. The revision was intended to: (1) better identify the management needed; (2) clarify language; (3) eliminate inconsistent and redundant direction; and, (4) establish a process that better responded to new information.

To accomplish this revision, three action alternatives were considered in a supplemental environmental impact statement. The conclusions in the Survey and Manage Final SEIS 2000 were expressed in a highly variable manner. For any given species, the process in that SEIS allowed for: 30 different descriptions of range and distribution, 5 different descriptions of populations, 24 different descriptions of habitat associations, 9 different descriptions of known sites, and 10 different standard conclusions for the outcome (USDA, USDI 2000a, Appendix J). The ability to summarize these conclusions is difficult because of the many variations in the way conclusions could be stated.

Potential outcomes based on population stability and distribution patterns were:

Outcome 1: Habitat (including known sites) is of sufficient quality, abundance, and distribution to allow species to stabilize in a pattern similar to reference distribution.

Outcome 2: Habitat (including known sites) is of sufficient quality, abundance, and distribution to allow species to stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions.

Outcome 3: Habitat (including known sites) is insufficient to support stable populations of the species.

Outcome 4: Information is insufficient to determine an outcome.

The results of the analysis were stated with varying degrees of uncertainty, either low, moderate, or high.

Alternative 1 from the Survey and Manage Final SEIS 2000 was adopted in the subsequent Record of Decision. Alternative 1 in the Survey and Manage Final SEIS 2000 is the approximate analytical equivalent to Alternative 1 (the No-Action Alternative) in this SEIS.

Comparison of Alternatives for this SEIS

The Agencies' Special Status Species Programs are described in detail in Chapter 2 of this SEIS. An analytical assumption of the environmental consequences is the inclusion of 130 Survey and Manage species in the Special Status Species Programs as shown in Table 2-8 as a foreseeable result of the rankings by the Oregon Natural Heritage Program.

The environmental consequences analysis of Alternative 2 includes removing the Survey and Manage mitigation measure for all 304 species and 4 arthropod guilds that are currently included under the Survey and Manage Standards and Guidelines. The environmental consequences analysis of Alternative 3 includes removing the Survey and Manage mitigation measure for the 26 uncommon species and 4 arthropod guilds that are currently included under the Survey and Manage Standards and Guidelines in Categories C, D, and F.

The Survey and Manage Standards and Guidelines and the Agencies' Special Status Species Programs are similar; they both contain species strategies that provide for site management and pre-project clearances (see Appendix 2, Comparison of Survey and Manage, BLM Special Status Species Program, and Forest Service Sensitive Species Program). While little management

discretion exists under the Survey and Manage Standards and Guidelines, on-the-ground management discretion exists for the Special Status Species Programs in survey methodology and in implementing protection measures in site-specific situations. This discretion in the Special Status Species Programs is constrained by program objectives that include maintaining viable populations in habitats distributed throughout the species range and managing to ensure actions do not contribute to the need to list species under the federal ESA. For the Forest Service, a biological evaluation is required to show loss of site(s) or habitat will not result in loss of species viability. A broad assumption of these analyses is that the outcomes for species under the Special Status Species Programs have general similarities to outcomes for species under the Survey and Manage Standards and Guidelines because of similarities in program strategies.

As noted throughout the species analyses in this SEIS, there is much that remains unknown about many of the species subject to analysis. Although some species are thought to be closely associated with late-successional and old-growth forests, for some species, the strength of this association is not well known. In addition, connectivity and habitat needs, range, and other specific information for many species are unknown or uncertain. Any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed. In situations where limited species-specific information is available, more reliance, by necessity, must be placed on information regarding the condition and management of the overall landscape in formulating conclusions regarding environmental consequences. The best available information was used to evaluate the alternatives.

The environmental consequences analysis in this SEIS affirms and incorporates by reference previous analyses in the Northwest Forest Plan Final SEIS and Survey and Manage Final SEIS 2000. Those analyses conclude the Survey and Manage Standards and Guidelines generally add protection to species and generally improve the outcomes for numbers, populations, and distribution. However, the Survey and Manage mitigation measure does not resolve concerns for all species. In the Survey and Manage Final SEIS 2000, there were many species for which there was inadequate information to draw a conclusion. Also, even with the Survey and Manage Standards and Guidelines, there was inadequate habitat to maintain stable, well-distributed populations for some species.

In addition, the analysis in this SEIS examines the following question: Is there a high risk of extirpation in the Northwest Forest Plan area? Recognizing there is much that remains unknown about many of the species, the analysis in this SEIS concludes that there is a reasonable certainty that some species are not likely to continue to exist in the Northwest Forest Plan area or in portions of the species range. In general terms, “a high risk of extirpation” is similar to the 2000 Survey and Manage Final SEIS outcome of “habitat is insufficient to support stable populations of the species” and the FEMAT definition of “extirpation risk species.” This question is meant to sharply compare and contrast the alternatives regarding the effects of federal management actions on species.

There are 137 species at high risk of extirpation in the Northwest Forest Plan area under all alternatives. These species are at high risk not because of federal actions but other factors such as: (1) limited potential habitat and few populations on federally managed lands; (2) potential for stochastic events; (3) low number of individuals; (4) limited distribution; and, (5) narrow ecological amplitudes (USDA, USDI 1994a and USDA, USDI 2000a). There are 47 species that are not at high risk of extirpation under Alternative 1, but are at high risk under Alternative 2. There are 7 species that are not at high risk of extirpation under Alternative 1, but are at high risk under Alternative 3 (see Table 3&4-10).

Under Alternatives 1 and 3, when the analyses shows that there is “insufficient information to draw a conclusion” or “there is a high risk of extirpation” for a species, this outcome is the same for Alternative 2 as well. Although the Survey and Manage mitigation measure under Alternatives 1 and 3 generally adds protection and reduces risk to species compared to Alternative 2, it does not eliminate the high risk of extirpation or resolve the inadequate information needed to determine the outcome for a species.

This SEIS analyzes the environmental consequences of the alternatives using a variety of information sources, including:

- FEMAT,
- Northwest Forest Plan Final SEIS, Chapter 3&4 and Appendix J2,
- Survey and Manage Final SEIS 2000, Chapter 3&4,
- the 2001 and 2002 Annual Species Reviews, and
- the ISMS Database.

This SEIS retains these analyses and conclusions and incorporates them by reference.

Aquatic Ecosystem

Background and Affected Environment

The Northwest Forest Plan provides for a high level of protection for all streams, lakes, and wetlands on Forest Service and BLM managed lands within the Northwest Forest Plan area. The Aquatic Conservation Strategy is a habitat-based approach for restoring and maintaining ecological health of watersheds and the aquatic ecosystems contained within them on these federally managed lands (USDA, USDI 1994a and USDA, USDI 1994b). The key assumption of the Aquatic Conservation Strategy in the Northwest Forest Plan was that species-specific strategies would be insufficient to maintain and recover the populations of aquatic-dependent species. The Northwest Forest Plan Record of Decision emphasized this concept by stating:

> "*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.*" (USDA, USDI 1994b, p. B-9.)

The four major components of the Aquatic Conservation Strategy (Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration) provide the basis for protection of aquatic-dependent and full-time and part-time riparian-dependent flora and fauna. Species that spend their entire life histories in water receive the highest degree of protection on federally managed lands, because they are all contained within Riparian Reserves. Managing Riparian Reserves under the specific standards and guidelines, combined with the other components of the Aquatic Conservation Strategy, should meet the habitat/life history needs of the water-dependent flora and fauna throughout the Northwest Forest Plan area. Riparian Reserves also benefit species that spend considerable portions of their life histories within the water or within riparian areas.

Alternative 9 in the Northwest Forest Plan Final SEIS incorporated Riparian Reserve Scenario 1, which increased the width recommended by the FEMAT from one-half site potential tree height or 50 feet, to one-site potential tree height or 100 feet, whichever is greatest, on each side of intermittent streams. This change was due to the additional species analysis and response to public and internal comments in the Northwest Forest Plan Final SEIS. The analysis in the Northwest Forest Plan Final SEIS underestimated the potential landscape level of protection provided by the Aquatic Conservation Strategy. The quantity of Riparian Reserve acres is higher than originally analyzed, and the amount of land within all reserves has increased from a 6:1 ratio of reserve to non-reserve lands in the Northwest Forest Plan Final SEIS to a 7:1 ratio. This higher acreage has resulted in a 15 percent decrease in PSQ when compared to that anticipated in the Northwest Forest Plan Final SEIS. The absolute increase in reserves is in addition to the increase in prescribed Riparian Reserve widths identified in the Northwest Forest Plan Record of Decision. The conclusions regarding the Aquatic Conservation Strategy contained in the Northwest Forest Plan Final SEIS remain valid after 9 years of implementation.

More than 20 species of fish occurring in the Northwest Forest Plan area have been listed under the ESA since the Northwest Forest Plan Record of Decision was signed (see Table 3&4-2 at the end of this chapter for complete list of listed fish). The majority of the listed salmonids are anadromous; the three bull trout Distinct Population Segments are resident species. These listings do not reflect the integrity of the Aquatic Conservation Strategy. The Northwest Forest Plan anticipated the potential of these listings and adopted a strategy to assist in the long-term recovery of the species. Factors other than habitat and land uses contributed to the need to list these species. Anadromous fish spend the majority of their life histories in areas outside of the federally managed lands covered by the Northwest Forest Plan. Other mortality factors (commercial and recreational fish harvest, ocean conditions, etc.) contributed to the listing of these fish. The relative contribution of each mortality factor was not identified in the listing announcements. The Northwest Forest Plan Final SEIS states:

> "*…the [Aquatic Conservation] strategy can succeed at maintaining and restoring the aquatic and riparian habitats regardless of what happens on nonfederal lands, but that would not ensure population viability of many of the fish stocks evaluated in this SEIS. For these reasons, it is not possible to determine whether any of the alternatives in this SEIS would preclude listing of fish species under the Endangered Species Act*." (USDA, USDI 1994a, p. 3&4-202.)

The Aquatic Conservation Strategy has been in place for approximately 9 years, a time period too short to demonstrate a measurable improvement in habitat conditions for fish populations to respond to the improved conditions. This, too, is consistent with the analysis contained in the Northwest Forest Plan Final SEIS and FEMAT Report. The authors of the Aquatic Conservation Strategy (USDA et al. 1993) stated:

> "*We emphasize, however, that it will require time for this strategy to work. Because it is based on natural disturbance processes, it may take decades to over a century to accomplish all of its objectives.*"

Implementing the Aquatic Conservation Strategy over the last 9 years has not affected the listings of water quality-impaired stream segments under section 303(d) of the Clean Water Act. Although the number of stream miles added to the 303(d) list in Oregon increased from approximately 12,000 miles during 1994-1996, to approximately 13,700 miles in 1998 (Oregon Department of Environmental Quality 1999), not all of these streams occur within the Northwest Forest Plan area. The increase in stream miles is due primarily to more information being available and a greater emphasis on water quality in recent years. For example, the State of Oregon initiated a statewide effort aimed at recovering declining fish stocks. The State's effort involved identifying water quality-impaired waterbodies and developing Water Quality Recovery Plans to address factors that contribute to the listing of the waterbody under section 303(d). The Northwest Forest Plan recognized these water quality concerns prior to their listing under 303(d). These listings are not new information for the Northwest Forest Plan.

Environmental Consequences

The Aquatic Conservation Strategy emphasizes restoring watersheds, ecosystem functions, and aquatic systems, which results in a high degree of protection for aquatic-dependent flora and fauna regardless of the alternative selected. The Riparian Reserve network is designed to protect and restore functions and processes of an interconnected network of aquatic systems (USDA, USDI 1994b). The Northwest Forest Plan Record of Decision requires Riparian Reserve widths that maintain the functions and processes that support the particular aquatic community and associated riparian area. Watershed analyses address the factors that affect the protection and restoration of the habitat type affected (such as a lake or wetland). They also recommend Riparian Reserve management designed to protect and restore the functions and processes necessary to support the habitat type. The Riparian Reserve widths applied through project-level NEPA decision documents are based on these watershed analyses.

Regardless of the understanding of the ecological needs of aquatic-dependent flora and fauna or their existing distribution, the Aquatic Conservation Strategy provides a high degree of protection of their habitat. The risk to the persistence of a particular species depends on its distribution and life history characteristics. Species that have very limited distribution throughout their known range and/or occur in rare or isolated habitats (wetlands, lakes, geothermal springs, isolated seeps, etc.) are generally at higher risk than more widely distributed species and/or species that utilize a broader range of habitat conditions.

The degree of dependence on water is also a risk factor. Species that spend their entire lives within water generally have a lower risk of long-term negative effects due to habitat-disturbing activities. Species that spend greater proportions of their life histories out of water and within Riparian Reserves have a somewhat higher risk to their persistence than purely aquatic species, but they have a relatively lower risk to their persistence than species that commonly use areas outside of Riparian Reserves. The other components of the Northwest Forest Plan, such as Late-Successional Reserves and Administratively Withdrawn Areas, provide other levels of protection for those species that spend more time outside Riparian Reserves.

All alternatives include the same protective measures to reduce the risk to aquatic-dependent flora and fauna at the site scale such as riparian buffers and associated standards and guidelines. Aquatic-dependent flora and fauna will all benefit from the restoration of functions and processes for aquatic ecosystems as required to meet the objectives in the Aquatic Conservation Strategy.

The Aquatic Conservation Strategy provides for a high degree of protection for aquatic and riparian associated species that may be locally rare, but have a wide distribution. Species that occur only in a few locales would be at a slightly increased risk compared to widely distributed aquatic or riparian species from habitat-disturbing activities under the Aquatic Conservation Strategy. Even though there could be short-term effects at the site scale, application of the Aquatic Conservation Strategy would yield functioning riparian and aquatic ecosystems at the landscape level in the long-term.

The effects of the alternatives to aquatic species do not change the outcomes described in the Northwest Forest Plan Final SEIS. This is due to the fact the Aquatic Conservation Strategy provides a high level of protection to aquatic habitats and associated species regardless of the presence of known sites for Survey and Manage or Special Status species. The managed area for Survey and Manage or Special Status species that contributes to additional protection for wetlands less than 1-acre would provide additional protection to other species that inhabit the affected wetland. These protections would accrue primarily at the site scale versus the scale of the Northwest Forest Plan and would not alter the conclusions reached in the Northwest Forest Plan Final SEIS.

None of the alternatives change the assessment outcomes toward achieving the Aquatic Conservation Strategy goals described in the Northwest Forest Plan Final SEIS. The effectiveness of the Aquatic Conservation Strategy in achieving its goals is independent of whether managed sites are added in the future or currently managed sites are removed from the Survey and Manage category. The goal of the Aquatic Conservation Strategy is to restore the functions and processes to maintain the ecological health of watersheds and aquatic ecosystems. The four components (Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration) were determined to effectively achieve the overall goal independent of the Survey and Manage mitigation measure. The Aquatic Conservation Strategy applied through the Northwest Forest Plan Record of Decision resulted in an 80 percent or higher likelihood of providing sufficient aquatic habitat to support stable, well-distributed populations of the seven races/species and groups of salmonids. Similarly, the Aquatic Conservation Strategy provides a high probability for aquatic species persistence.

Late-Successional Forest Ecosystem

Background and Affected Environment

The Northwest Forest Plan is an ecosystem approach to land management that focuses on habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. The Northwest Forest Plan features a functional, interconnected, late-successional forest ecosystem that is extensive and well distributed and provides dispersal and movement between populations of species. The Northwest Forest Plan comprises a network of reserves, which protect large blocks of late-successional forest and aquatic resources, and Matrix where most timber harvest occurs. In general, the reserve system is designed to be comprehensive, adequate, representative, and replicated. The proportion of the landscape in reserves varies among physiographic provinces; the reserves always predominate, ranging from 59 percent to 99 percent at the province level (USDA et al. 1993, pp. IV-64 and IV-65 and USDA, USDI 1994a, Appendix G, p. G-35).

Within the context of the Northwest Forest Plan, late-successional forest stands typically begin between 80 and 130 years, depending on site conditions and stand history (USDA, USDI 1994b, p. B-3). The Northwest Forest Plan anticipated and planned for increases in late-successional acres in the long term, as well as short-term harvest of late-successional stands in Matrix and Adaptive Management Areas. Standards and guidelines for Late-Successional Reserves are designed to maintain late-successional forest ecosystems and protect them from catastrophic loss to large-scale fire, insect and disease epidemics, and major human impacts. Nevertheless, the Northwest Forest Plan acknowledged the role of natural disturbance in the development of late-successional forests and anticipated continued disturbances, even large-scale fire, in the reserves (USDA, USDI 1994a, pp. 3&4-46 through 49 and 3&4-89 through 91, and USDA, USDI 1994b, pp. B-3 through B-4). The reserves are designed to maintain frequent, low-intensity natural ecosystem processes such as gap dynamics, natural regeneration, pathogenic fungal activity, insect herbivore, and low-intensity fire (USDA, USDI 1994b, pp. B-8 through B-9 and C-13 through C-14).

The Matrix is an integral part of the conservation strategy. Lindenmayer and Franklin (2002) identify five guiding principles for matrix management: (1) maintain connectivity; (2) maintain landscape heterogeneity; (3) maintain stand complexity; (4) maintain aquatic ecosystem; and, (5) risk spreading. Land allocations and standards and guidelines important to maintaining ecological processes include: (1) Riparian Reserves; (2) 100-acre owl activity centers; (3) Connectivity Diversity Blocks (BLM lands north of Grants Pass); (4) green tree and snag retention within cutting units; (5) provisions for downed woody debris; and, (6) protection of all remaining late-successional stands within fifth-field watersheds currently comprised of 15 percent or less late-successional forests on federally managed lands. Estimates from FEMAT on the percent of the land base within Riparian Reserves commonly ranged from 45 to 70 percent (Johnson et al. 1993). Estimation done on individual administrative units has found that these initial estimates were conservative and, in most cases, Riparian Reserves were more extensive than originally estimated. Approximately 81,000 acres or 1 percent of the late-successional forest were projected to be managed for the protection of Survey and Manage species (USDA, USDI 2000a, p. 436).

The Northwest Forest Plan and this SEIS assume a continuation of succession and disturbance processes that interrupt succession. Assumptions used in this SEIS also include the natural variability in successional process rates and directions. The late-successional forest ecosystems in the Northwest Forest Plan area are dynamic and have historically experienced varying levels of disturbance, generally from frequent, low-intensity fires in the dry, southern provinces to infrequent, severe fires in the northern provinces (USDA, USDI 1994a, pp. 3&4-17 through 24, 3&4-88 through 91, and B-44 through 46; and USDA, USDI 2000a, p. 208). Although disturbance regimes (high rates of change) are often described precisely in terms of frequency, intensity, duration, and extent, such regimes are also highly variable. For example, the average fire return interval in the temperate forests of Oregon vary from less than 10 years between

fires at low elevation, drier habitats to more than 100 years between fires in the high elevation, moister habitats. Variability throughout the overall region is greater yet. These frequencies seem precise, but the standard deviations (variability associated with the average) are often greater than the average. This means that average conditions and average rates of change can only be approximated. Because natural variability is wide, chaotic, and takes at least several decades to establish patterns and trends, it is premature to effectively evaluate human-caused effects and trends since the establishment of the Northwest Forest Plan 9 years ago.

Environmental Consequences

In assessing the environmental consequences of the alternatives to the 304 Survey and Manage species, specific information about the species is used whenever available. Information about the exact habitat requirements of many organisms does not exist, nor is it possible to accurately predict the exact consequences of each potential land management activity for all species (USDA, USDI 1994a, p. 3&4-122). When specific species information is insufficient to base a conclusion of reasonable certainty regarding the likelihood of extirpation or persistence, reliance must be made on information regarding the overall design and effectiveness of the Northwest Forest Plan (land allocations, standards and guidelines, and other assumptions) and the understanding of the overall ecology of the late-successional forest ecosystem within the Northwest Forest Plan area.

PSQ has been adjusted downward by approximately 15 percent primarily to more accurately reflect the extent of Riparian Reserves. This has resulted in a corresponding increase in protection of late-successional forest. Under Alternatives 1, 2, and 3, less than 4 percent of existing late-successional forest on federally managed lands would be disturbed per decade by management actions such as partial cut harvests, regeneration harvests, and prescribed fire. In relation to long-term and regional ecological objectives, the environmental consequences associated with the rates of management disturbance per decade would not be meaningful because they are so small in comparison to the large extent of reserves and the large range of natural variability. Because the rate of disturbance through management activities is so small, there would be no meaningful difference in environmental consequences to the forest ecosystem, as a whole, between the alternatives.

Under all alternatives, late-successional and old-growth forest is anticipated to be replaced due to aging of existing stands across the Northwest Forest Plan area in the long term at a rate 2.5 times greater than the rate of current anticipated harvest. In the long term, large blocks of late-successional and old-growth forest would be limited to the reserves and administratively withdrawn land allocations (USDA, USDI 1994a, pp. 3&4-42 through 46). The Matrix would include smaller patches of late-successional forest (such as within connectivity/diversity blocks) and late-successional structural elements within younger or multi-aged stands (such as older trees, snags, and coarse woody debris) (USDA, USDI 1994b, pp. C-40 through C-43).

FEMAT and the Northwest Forest Plan assessed the likelihood of maintaining a functional and interconnected, late-successional forest ecosystem. The ecosystem assessments were based upon diversity, function, dynamics, and spatial patterns of the late-successional forest ecosystem. Three attributes were assessed: (1) abundance and ecological diversity; (2) processes and function; and, (3) connectivity. Because the amount of forest habitat that is managed for known sites under the Survey and Manage Standards and Guidelines is so small when compared to the 20 million acres of reserves, the rating of the likelihood of maintaining a functional and interconnected, late-successional forest ecosystem would not substantively vary among the three alternatives. Moreover, variation associated with implementation of the alternatives is likely to be insignificant when compared to the effects of successional disturbance processes and because of the high natural variability of the forest ecosystems.

The most substantial effect of Alternatives 1 and 3 would be when the species-specific direction of the Survey and Manage Standards and Guidelines conflict with the Northwest Forest Plan strategy of maintaining functioning, late-successional forest ecosystems. An example of this conflict is the

use of prescribed fire (or wildland fire for resource benefits) to restore ecological functions to fire-associated forests in southern or eastside provinces when the known site of a Survey and Manage species consists of habitat resulting from the exclusion of fire from the ecosystem. Management aimed at dampening extreme ecological variations caused by fire tends to lead to extreme magnification of the effects associated with disturbance (USDA et al. 1993, pp. IV-35 through IV-36 and IV-71 through IV-76; USDA, USDI 1994b, p. B-4; and USDA, USDI 2000a, p. 205).

Given that approximately 80 percent of the Northwest Forest Plan area (and 86 percent of currently existing late-successional forests) is in reserves, most late-successional and old-growth forest related species are likely to be adequately protected by the reserve system. There may be greater uncertainty about some late-successional and old-growth forest related species, such as those that have limited distribution and that are highly intolerant of disturbance. However, the design of the reserve system, which generally provides the most reserves in those physiographic provinces that had the most late-successional forest historically and the least natural disturbance, provides some additional assurance that late-successional and old-growth forest related species adapted to more static systems are adequately protected by the reserve system.

Within the late-successional forest ecosystems in the Northwest Forest Plan area, in order for species to persist, they would likely need some tolerance for disturbance at least at the population level. Tolerance for disturbance by species at the population level is needed because the forest ecosystems are dynamic and have historically experienced levels of disturbance as described above.

Physiographic provinces with the least reserves and most Matrix are the Willamette Valley, California Cascades, and the Oregon Klamath Provinces. In the Willamette Valley Province, 66 percent of all federally managed forest and 59 percent of late-successional forest is in Reserves. In the California Cascade Province, 57 percent of all federally managed forest and 68 percent of late-successional forest is in Reserves. In the Oregon Klamath Province, 68 percent of all federally managed forest and 74 percent of late-successional forest is in reserves. These provinces have had historically high fire frequencies, have had the least late-successional forests, and have had forests that were naturally highly fragmented (USDA, USDI 1994a, pp. 3&4-21 through 3&4-24, 3&4-37; and USDA, USDI 2001b). Species that might be limited predominately to the Matrix in these areas would most likely have evolved in an ecosystem characterized by the least late-successional forest, the least connectivity of late-successional habitat, and the most frequent disturbance. Therefore, in general and in the absence of specific information to the contrary, if there are late-successional and old-growth forest related species that are restricted to provinces that have disproportionately more Matrix, such as the Willamette Valley, California Cascades, and Oregon Klamath provinces, then they are more likely to be at less risk of extirpation from limited or fragmented late-successional habitat, and are more likely to be relatively tolerant of disturbance.

Physiographic provinces with the most infrequent fire have the most reserves and least Matrix. The Olympic Peninsula and high elevations of Western Washington Cascades have "... the lowest fire frequencies of Pacific Northwest forest ecosystems" (USDA, USDI 1994a, pp. 3&4-17 through 18). In the Olympic Peninsula Province, 92 percent of all federally managed forest and 99 percent of late-successional forest is in reserves. In the Western Washington Cascade Province, 88 percent of all federally managed forest and 92 percent of late-successional forest is in reserves (USDA, USDI 1994a, pp. 2-39 and G-35). Therefore, if there are species that are restricted to these provinces, they may be highly intolerant of disturbance (in contrast to species that might be restricted to the drier provinces described above). However, if there are species restricted to these provinces that are highly intolerant of disturbance, they are likely to be adequately protected by the reserve system, because these provinces have disproportionately more reserves.

Global Climate

The conclusion of the Northwest Forest Plan Final SEIS was that the Northwest Forest Plan would cause a change in global atmospheric carbon dioxide of less than 0.01 percent of the total (USDA, USDI 1994a, pp. 3&4-46, and 3&4-50 through 51). The Survey and Manage Final SEIS 2000 concluded that this increase would be even less because of the lower harvest levels than originally anticipated (USDA, USDI 2000a, p. 203). There is no new information that would alter these conclusions.

Air Quality

Background and Affected Environment

The federal Clean Air Act, as amended in 1990, is designed to reduce air pollution, protect human health, and preserve the Nation's air resources. To protect air quality, the Clean Air Act requires federal agencies to comply with all federal, state, and local air pollution requirements (Section 118). Several federal air quality programs under the Clean Air Act regulate prescribed burning and other activities. Prescribed fire can be used as a tool for treating logging residue and for restoring ecosystem processes. Wildland fire for resource benefits is the term used for managing natural fire ignitions to meet resource objectives

While prescribed fire and wildland fire for resource benefits can create large quantities of particulate matter (PM10) and other pollutants, this burning usually takes place in relatively remote areas with intensities that vent smoke high into the atmosphere where it is widely dispersed (USDA, USDI 1994a, p. 3&4-91). The Northwest Forest Plan Final SEIS estimated PM10 levels under Alternative 9, aggregated across climatic groups (moist, dry, or intermediate), to be 35-40 percent of historic PM10 levels (1985-1992) (USDA, USDI 1994b, p. 3&4-96).

Environmental Consequences

An estimated 165,300 acres annually would be available for fuel treatment under Alternative 1. Under Alternative 2, an estimated 161,600 acres would be available and, under Alternative 3, an estimated 162,600 acres would be available for fuel treatment (for further discussion see the Wildland and Prescribed Fire section later in this chapter). The 113,500 acres of estimated annual wildfire is the same under all alternatives. The 72,500 acres planned for wildland fire for resource benefits are the same under all alternatives. The acres burned for prescribed fire, wildland fire for resource benefits, and wildfire for each alternative would be less than the 476,000 annual acres that were projected under Alternative 9 of the Northwest Forest Plan. None of the alternative would exceed the level of impacts analyzed in the Northwest Forest Plan.

Water Quality

Background and Affected Environment

Water flowing from forested areas administered by the Agencies has a number of beneficial uses. The Clean Water Act directs federal agencies to comply with state water quality requirements to restore and maintain water quality necessary to protect beneficial uses. The Agencies are the designated management agencies within the range of the northern spotted owl, charged with implementing and enforcing natural resource management programs for the protection of water

quality on lands they administer. The four major components of the Northwest Forest Plan's Aquatic Conservation Strategy are Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration. These provide for maintaining and improving water quality.

Environmental Consequences

None of the alternatives change the provisions of the Northwest Forest Plan that provide for restoring and maintaining water quality on federally managed lands in the Northwest Forest Plan area. None of the alternatives change the analysis or outcomes for water quality described in the Northwest Forest Plan.

Soil Productivity

Background and Affected Environment

The combined influences of time, parent material, climate, living organisms, and the topography of a site interact to form soils with unique sets of physical and chemical properties that determine the productivity of each soil type. Soil productivity is a soil's ability to produce vegetation. Long-term forest soil productivity is the capacity or suitability of a soil to establish and grow a plant species and community over time, primarily through nutrient availability and available soil moisture. Ecosystem structures and functions ultimately depend on productive soils.

Environmental Consequences

Forest management practices have the potential to reduce natural productivity if certain operating guidelines are not followed. Under all alternatives, implementation of soil management prescriptions and best management practices would prevent unacceptable degradation of the soil resource and related productivity (USDA, USDI 1994, p. 3&4-111). None of the alternatives change the provisions of the Northwest Forest Plan that provide for maintaining soil productivity. Therefore, none of the alternatives change the analysis or outcomes for soil productivity described in the Northwest Forest Plan Final SEIS.

Wildland and Prescribed Fire

Background and Affected Environment

Wildfire and the Ecosystem

The late-successional forest ecosystems in the Northwest Forest Plan area are dynamic and have historically experienced varying levels of disturbance. Historical fire regimes have generally ranged from frequent, low-intensity fires in the dry, southern provinces to infrequent, high-intensity fires in the northern provinces (USDA, USDI, 1994, pp. 3&4-17 through 24, 3&4-88 through 91, and B-44 through B-46; and USDA, USDI 2000a, p. 208). Fire has shaped the Northwest Forest Plan area landscape and influenced the species that live here. Fire history and existing data indicates that Survey and Manage species have persisted under a low and moderate fire intensity combined with more frequent historic fire intervals.

Fire suppression throughout the western U.S. has often interrupted natural fire regimes. Where fire once created a mosaic of patches, large areas have built up high fuel levels, leading to

increased risk of high-intensity, stand-replacing fire where it historically does not occur. Interruption of natural fire regimes has a direct effect on ecosystem species composition and sometimes on species persistence (USDA, USDI 1994a, p. 3&4-83).

Wildland fires burned more than 600,000 acres in the Northwest Forest Plan area during the 2002 fire season. Initial post-fire data on burn severity has been collected for several of the large fires in southwest Oregon. Actual burn severity will be more evident in the summer of 2003 when tree mortality is fully expressed. Table 3&4-3 shows the percent of acres burned by fire intensity.

The Umpqua National Forest lies largely within the Oregon Western Cascades Physiographic Province. This province includes a wide variety of climates and forest types. In 2002, approximately 89,000 acres of fire burned on the Umpqua National Forest. Preliminary analysis indicates some areas burned within the range of natural variation and some areas burned more intensely (www.fs.fed.us/r6/umpqua/fire/fire_recovery/index.php).

The nearly 500,000-acre Biscuit Fire burned largely in the Oregon Klamath Physiographic Province. This province is characterized by high-frequency fire, both historically as well as at present. Approximately 77 percent of the area burned experienced a moderate- to high-intensity burn (equal to or greater than 26 percent tree mortality). A high-frequency fire regime normally experiences small, low-severity fires.

A recent study in the Klamath Mountains demonstrated that fire return intervals at the watershed and burn level were historically more frequent than previously documented (Taylor and Skinner 2002). Fire suppression has altered the fire regimes in the study area from a historic fire return interval of 20 years to a current fire return interval of 238 years (Taylor and Skinner 2002).

Intensive fire suppression efforts in the last 70 years have resulted in significant fuel accumulations in some areas, and shifts in tree species composition and forest stand structure. These changes may have made forests more susceptible to large, high-severity fires (USDA, USDI 1994a, p. 3&4-22). The initial analyses of burn severity classes in recent fires along with results of the Klamath Mountains study appear to validate these conclusions from the Northwest Forest Plan.

Fire Risk Management in the Northwest Forest Plan Area

The FEMAT report (p. III-35) states:

> "*Large-scale disturbances are natural events, such as fire, that can eliminate owl habitat on hundreds or thousands of acres. Certain risk management activities, if properly planned and implemented, may reduce the probability of these major stand-replacing events. There is considerable risk of such events in Late-Successional Forest Reserves in the eastern Oregon Cascades, eastern Washington Cascades, and California Cascades provinces and a lesser risk in the Oregon Klamath and California Klamath provinces. Elevated risk levels are attributed to changes in the characteristics and distribution of the mixed-conifer forests resulting from past fire protection.*"

Table 3&4-3. Percent of acres burned and fire intensity for the 2002 wildfires on the Umpqua and Siskiyou National Forests.

Fire	% of Acres Burned	Fire Intensity	% of Tree Mortality
Umpqua National Forest (Multiple Fires)	82	Low	<25
	11	Moderate	25-90
	7	High	>90
Siskiyou National Forest (Biscuit)	77	Moderate-High	>26

Risk management activities include wildland fire for resource benefits and silvicultural practices. Wildland fire for resource benefits is the use of naturally-ignited wildfires. Silvicultural practices include activities such as thinning tree stands, creating fuel breaks, controlling bark beetle infestations, and prescribed fire (human induced under-burning of forest stands to reduce fuel loading).

Recent studies have displayed the benefit of fuel treatment to post-wildland fire survival in coniferous trees (Omi and Martinson 2002). The studies demonstrated that thinning tree stands and conducting prescribed burns in those stands contributed to post-wildland fire tree survival. In the Lassen National Forest in northern California, the 2002 Cone Fire showed that thinned and prescribed burned forests survived an intense wildland fire, while adjacent untreated stands resulted in high-burn severity (Skinner 2002, pers. comm.).

National Fire Plan

Small communities and other developed private lands bordered by federally managed lands can be directly affected by fuels conditions on federally managed lands. Threats posed by fuel accumulations were realized in summer 1999 (wildfires in northern California), in summer 2000 (in other western states), and again with the large wildfires in southern Oregon during summer 2002.

As a consequence of the over 8 million acres burned nationally in 2000, the President created the National Fire Plan (USDA, USDI 2000b). Activities such as firefighting, rehabilitation and restoration, hazardous fuels reduction, community assistance, and research are included in the plan. The National Fire Plan proposes aggressive hazardous fuels abatement activities around communities and at-risk landscapes. Specific direction for implementation and accountability was received from Congress in the Fiscal Year 2001 Interior and Related Agencies Appropriations Act. The Forest Service and the Department of the Interior are in the second year of implementing the National Fire Plan.

Environmental Consequences

As noted in the Survey and Manage Final SEIS 2000, the historic natural wildfire level of 476,000 acres burned annually is used as the goal for annual fuel treatment acres.

Wildfire and wildland fire for resource benefits are expected to burn 113,500 acres and 72,500 acres per year, respectively. This leaves 290,000 acres potentially available for hazard fuels reduction. These acres are in need of fuel treatments and the goal is to achieve this level in the future. Due to current budgets, personnel limitations, air quality concerns, and other constraints, the “potentially available” acres were reduced to 190,000 acres. This is consistent with the figures used in the Survey and Manage Final SEIS 2000. After subtracting acres treated for regeneration timber sales (which varies by alternative), 165,300 acres are potentially available for fuel treatment annually under Alternative 1; for Alternative 2, the amount is 161,600 acres; for Alternative 3, the amount is 162,600 acres. It is assumed that the acres treated for regeneration timber sales will not need treatments to reduce hazardous fuels.

Wildland Fire for Resource Benefits

Annually, 72,500 acres are planned for wildland fire for resource benefits. Allowing naturally-ignited fires to burn within prescribed parameters can generate a benefit to resources across the landscape. The benefits gained from allowing a naturally-ignited fire to burn under prescribed conditions typical of frequent, historic, low-to-moderate burns would far outweigh the values lost in these same stands if a high-intensity wildfire were to occur.

Under Alternative 1, pre-disturbance surveys are not required for wildland fire for resource benefits in designated Wildernesses. Additionally, exceptions to the pre-disturbance survey requirement, subject to Regional Ecosystem Office (REO) review, may be proposed for other wildland fires for resource benefits in backcountry, Wilderness Study Areas, roaded natural and similar areas where the objective of such fires is similar to those in Wilderness. Similarly, exceptions to the pre-disturbance survey requirement may also be proposed for wildland fire for resource benefits in Late-Successional Reserves if the Late-Successional Reserve Assessment, also subject to review, addresses the potential presence and likely effect on Survey and Manage species.

Under Alternative 2, the Agencies' Special Status Species Programs allow management decisions related to species sites to be made at the local level. Exceptions to the clearance survey requirements would be made locally.

Under Alternative 3, for Category A rare species managed under the Survey and Manage Standards and Guidelines, pre-disturbance surveys are not required for wildland fire for resource benefits in Wildernesses or in non-late-successional and non-old-growth stands. Additionally, exceptions to the pre-disturbance survey requirement, subject to local review, may be proposed for other wildland fires for resource benefits in backcountry, Wilderness Study Areas, roaded natural and similar areas where the objective of such fires is similar to those in Wilderness. Similarly, exceptions to the pre-disturbance survey requirement may also be proposed for wildland fire for resource benefits in Late-Successional Reserves if the Late-Successional Reserve Assessment, also subject to local review, addresses the potential presence and likely effect on Survey and Manage species. For species managed under the Agencies' Special Status Species Programs management exceptions to the clearance survey requirements would be made locally.

Under all alternatives, exceptions to pre-disturbance or pre-project clearances would be allowed. None of the alternatives would change the acres available for burning through wildland fire for resource benefits.

Hazardous Fuel Treatments

Under Alternative 1, potentially 165,300 acres would be available annually for fuel treatments. The actual acres available for treatment would be reduced by the need to manage known sites for Survey and Manage species. Based on the amount of late-successional forest and projected known sites (as analyzed in the Timber Harvest section), it is estimated that 10,400 acres would be protected annually. Although some of these sites may not prohibit the use of prescribed fire, burning conditions around other known sites would necessitate additional buffering to keep fire entirely off the slope where known sites occur. On average, this additional buffering would prohibit burning on 3 times more acres than would actually be contained in known sites. Under Alternative 1, the acres available annually for fuel treatments would be 134,100.

Under Alternative 2, potentially 161,600 acres would be available annually for fuel treatments. The actual acres available for treatment would be reduced by the need to manage known sites for Special Status species. Based on the amount of late-successional forest and projected known sites (as analyzed in the Timber Harvest section), it is estimated that 2,300 acres would be protected annually. Under Alternative 2, local managers could identify some known sites as not needed to prevent listing under the ESA and not needed to meet the Forest Service viability and diversity requirements. Burning conditions around some known sites will necessitate additional buffering to keep fire entirely off the slope where known sites occur. Additional buffering would be less under Alternative 2 than under Alternative 1 due to flexibility in local management decisions. On average, it is estimated that additional buffering would prohibit burning on 1.5 times more acres than would actually be contained in known sites. Under Alternative 2, the acres available annual for fuel treatments would be 158,200.

Under Alternative 3, potentially 162,600 acres would be available annually for fuel treatments. The actual acres available for treatment would be reduced by the need to manage known sites for

Survey and Manage and Special Status species. Based on the amount of late-successional forest and projected known sites (as analyzed in the Timber Harvest section), it is estimated that 4,550 acres would be protected annually. For Special Status species under Alternative 3, local managers could identify some known sites as not needed to prevent listing under the ESA and not needed to meet the Forest Service viability and diversity requirements. For Survey and Manage species under Alternative 3, local managers could identify some known sites as not needed for persistence according to the management direction contained in the Survey and Manage Standards and Guidelines. Burning conditions around some known sites will necessitate additional buffering to keep fire entirely off the slope where known sites occur. Additional buffering would be less under Alternative 3 than under Alternative 1 due to flexibility in local management decisions. On average, it is estimated that additional buffering would prohibit burning on 2 times more acres than would actually be contained in known sites. Under Alternative 3, the acres available annually for fuel treatments would be 153,500.

Under Alternative 1, pre-disturbance survey costs are projected to be $73.18 per acre. Because portions of projects are abandoned or deferred during the planning process, the Agencies survey about 10 percent more acres than what is proposed for treatment. With annual surveys covering 181,800 acres (165,300 acres + 10 percent), total pre-disturbance survey costs under Alternative 1 would be approximately $13.3 million annually or $99 per acre treated.

Under Alternative 2, pre-project clearance survey costs would be $54.78 per acre. Management activities in non-late-successional and non-old-growth forest stands would likely not receive pre-project clearance surveys. It is estimated that approximately half the potential fuel treatment acres would not need these surveys. Because portions of projects are abandoned or deferred during the planning process, the Agencies survey about 10 percent more acres than what is proposed for treatment. With annual surveys covering 88,880 acres (80,800 acres + 10 percent), total pre-disturbance survey costs under Alternative 2 would be approximately $4.9 million annually or $31 per acre treated.

Under Alternative 3, pre-disturbance survey costs are projected to be $63.23 per acre. Management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. It is estimated that approximately half the potential fuel treatment acres would not need these surveys. Because portions of projects are abandoned or deferred during the planning process, the Agencies survey about 10 percent more acres than what is proposed for treatment. With annual surveys covering 89,430 acres (81,300 acres + 10 percent), total pre-disturbance survey costs under Alternative 3 would be approximately $5.7 million annually or $37 per acre treated.

Under all alternatives, treatment costs per acre vary from $50 to $150 for prescribed fire and from $400 to $600 for mechanical treatments. Treatment costs are generally higher around known sites for Survey and Manage and Special Status species because treatment methods are limited and prescribed fire is more likely to be prohibited. Treatment costs would be increased an average of $550 per acre for known sites. Under Alternative 1, based on the amount of late-successional forest and projected known sites (in the acres available annually for fuel treatments), it is estimated that each year 8,448 acres would have these increased costs. This would result in a total increased cost of approximately $4.5 million annually. Averaged over all the acres actually treated, this would result in an increased cost of $35 per acre ($4.5 million/134,100 acres). Under Alternative 2, based on the amount of late-successional forest and projected known sites (in the acres available annually for fuel treatments), it is estimated that each year 2,200 acres would have these increased costs. This would result in a total increased cost of approximately $1.2 million annually. Averaged over all the acres actually treated, this would result in an increased cost of $8 per acre ($1.2 million/158,200 acres). Under Alternative 3, based on the amount of late-successional forest and projected known sites (in the acres available annually for fuel treatments), it is estimated that each year 4,300 acres would have these increased costs. This would result in a total increased cost of approximately $2.4 million annually. Averaged over all the acres actually treated, this would result in an increased cost of $15 per acre ($2.4 million/153,500 acres).

Mitigation for 63 species under Alternative 2 would result in 1,700 fewer acres available for annual fuel treatments and an increase in $5 per acre to protect species compared to Alternative 2 without mitigation.

Mitigation for 10 species under Alternative 3 would result in a negligible effect on acres available for annual fuel treatments and cost per acre to protect species compared to Alternative 3 without mitigation.

In summary, under Alternatives 2 and 3 there would be more acres available for hazard fuel reduction treatments at lower costs. This would result in increased ability to implement projects designed to improve forest health and would also assist in better implementation of the National Fire Plan.

Bryophytes

Background and Affected Environment

Bryophytes are a distinct group of green, spore-bearing, nonvascular plants that include mosses, hornworts, and liverworts. They reproduce by producing spores, which are usually wind dispersed or through specialized asexual structures. Although they are especially vulnerable to disturbance they have managed to colonize a wide variety of habitats throughout the world.

Bryophytes are important components in the forest canopy and understory habitats of late-successional and old-growth forests. They contribute to the species diversity, primary productivity, and biomass of these stands. Old-growth forests may be essential to the continued existence of some bryophytes (USDA et al. 1993, p. IV-101).

Habitat components important to some bryophytes include live, old-growth trees, decaying wood, riparian zones, and generally the habitat characteristics achieved by more extensive and interconnected late-successional and old-growth forested conditions. Snags, shaded rock outcrops,

Table 3&4-4. Comparison of Fuel Treatment Acres and Costs.

Comparison of Fuel Treatments			
	Alternative 1	**Alternative 2**	**Alternative 3**
Proposed fuel treatments (annual acres)	165,300	161,600	162,600
Proposed fuel treatments precluded by management of known sites (annual acres)	31,200	3,400	9,100
Actual available fuel treatments (annual acres)	134,100	158,200	153,500
Actual available fuel treatments with mitigation (annual acres)	134,100	156,500	153,500
Comparison of Costs per Acre Treated			
Pre-project clearances ($/acre)	99	31	37
Additional treatment costs to manage sites ($/acre)	35	8	15
Total costs to manage S&M or SSSP species	134	39	52
Total costs to manage S&M or SSSP species with mitigation	134	44	52

rotten logs, and stumps also provide suitable substrate for numerous bryophyte species.

Since 1994, new information has been acquired on the occurrence and distribution of bryophyte species from strategic and pre-disturbance surveys, herbaria, literature, field units, and taxonomic experts. This knowledge has been used during the annual species review process to move species between categories and to remove some species from the Survey and Manage mitigation measure.

Environmental Consequences

Under Alternative 1, 15 bryophytes would be included under the Survey and Manage Standards and Guidelines. Alternative 1 would provide management of known or high-priority sites, strategic surveys, and pre-disturbance surveys for 3 species (see Table 2-8).

Under Alternative 2, 14 species are assumed to be included in the Agencies' Special Status Species Programs (see Table 2-8).

Under Alternative 3, 15 bryophyte species would be included under the Survey and Manage Standards and Guidelines (Categories A, B, or E). Management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys for three Category A Survey and Manage species (*Ptilidium californicum*, *Schistostega pennata*, and *Tetraphis geniculata*).

Under all alternatives, bryophytes receive protection under the network of reserves. The Northwest Forest Plan Final SEIS concluded that several of the alternatives analyzed, including Alternative 9, were most favorable to bryophytes because they provide the set of allocations and management practices that best produces habitat components for bryophytes (USDA, USDI 1994a, p. 3&4-133).

Brotherella roellii

This Pacific Northwest endemic species is known from the lower mainland area of British Columbia and only five historical sites in Washington. It is currently unknown if *Brotherella roellii* is still extant at these five sites.

Under Alternatives 1 and 3, this species would be included in Category E which requires strategic surveys and management of all known sites. Given the uncertainty regarding the status of this species in the Northwest Forest Plan area, there is insufficient information to determine how these alternatives would affect distribution and stability of this species (USDA, USDI 2000a, p. 223). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, this species is assumed not to be included in any of the Agencies' Special Status Species Programs. Given the uncertainty regarding the status of this species in the Northwest Forest Plan area, there is insufficient information to determine how the alternative would affect distribution and stability of this species. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Buxbaumia viridis (CA only)

It is well distributed in Oregon and Washington (USDA, USDI 2002). In California, this species is known from four sites in northern California, three of which occur on National Forest System lands. These three sites occur outside of reserves. Given the low number of sites, loss of any site could affect populations to the point of leading to extirpation. Although this species has a broad global distribution (USDA, USDI 2000a, p. 235), it is widely scattered elsewhere and it is listed as vulnerable on the European Red List (Hallinback 1998).

Under Alternatives 1 and 3, this species would be included in Category E which requires strategic surveys and management of all known sites. *Buxbaumia viridis* would stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 237). Due to protection of known sites, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a Bureau Sensitive species on California BLM lands. This species is assumed not to be included in the Forest Service Sensitive Species program in California. There is a high risk of loss of the three known sites on National Forest System lands in California. According to a study by Wiklund (2002) *Buxbaumia viridis* needs constant access to wood in a late stage of decay in order to colonize and survive in forests. Although the current standard and guidelines provide for the retention of existing coarse woody debris and the addition of 120 or 240 linear board feet, it does not specify that the decay class of the retained or added material needs to be at least decay class 3 or greater to meet the substrate requirements for this species. This would reduce the populations at the southern edge of its range and would lead to a high risk of extirpation in California. However, due to the fact that it is well-distributed in Oregon and Washington, there would not be a high risk of extirpation for this species range-wide in the Northwest Forest Plan area under Alternative 2.

Diplophyllum plicatum

As a result of new information from pre-disturbance and proposive surveys, there are approximately 80 known sites for this species. These sites are primarily restricted to two cluster populations on Coos Bay BLM and the Olympic Peninsula. While most of the sites on Coos Bay BLM are in reserve allocations, not all of the sites on the Olympic Peninsula are in reserves. There are scattered occurrences in between these two clusters. This species is not currently known from California.

Under Alternatives 1 and 3, this species would be included in Category B which requires management of all known sites and strategic surveys. With a high level of uncertainty due to low numbers and spotty distribution, *Diplophyllum plicatum* would stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 227). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a BLM Bureau Assessment species in Oregon and Washington. This species is assumed not to be included in the Forest Service Sensitive Species Program in Washington and Oregon. In locations where the species is not included under the Special Status Species Programs and are not protected by reserves, loss of habitat and populations would limit the gene flow and dispersal capability for this species especially between the two larger cluster populations. However, due to protection of existing known sites in reserves and assumed inclusion in the BLM Special Status Species program in Oregon and Washington, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Herbertus aduncus

This species extends from Alaska to Oregon where it reaches the southern edge of its range in western North America. Recent proposive surveys have located several additional populations in the Columbia Gorge and on the Mt. Baker-Snoqualmie National Forest. Current information indicates that this species is rare and limited in distribution (USDA, USDI 2000a, p. 230).

Under Alternatives 1 and 3, this species would be included in Category E which requires management of all known sites and strategic surveys. Due to low number of sites, there is insufficient information to determine how any alternative would affect distribution and stability of this species (USDA, USDI 2000a, p. 230). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be a Bureau Assessment species on BLM lands in Washington and Oregon. It is assumed not to be included in the Forest Service Sensitive Species Program in Washington and Oregon. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Iwatsukiella leucotricha

Prior to 2002, there were only two known sites of this species in the continental United States. Both sites were on nonfederal land in Oregon. Recent proposive surveys in Washington on the Olympic National Forest and Washington State Department of Natural Resources lands have located six new sites which brings the total number of known sites in the continental United States to eight. Five of these new sites are assumed to be located within Late- Successional Reserves. Because this species is known from few sites and current information indicates that it is rare and limited in distribution (USDA/USDI 2000, p. 230), any loss of sites would limit the dispersal potential and lead to the decline in the number of sites in the United States.

Under Alternatives 1 and 3, this species would be included in Category B which requires management of all known sites and strategic surveys. Due to protection of sites in reserves and management of known sites, there would not be a high risk of extirpation for this species in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a Bureau Assessment species on Oregon/Washington BLM managed lands and a Sensitive Species on Forest Service managed lands in Washington and Oregon. Since the five new locations on the Olympic National Forest are assumed to be located in Late-Successional Reserves, protection would be provided for these sites. Due to inclusion in the Special Status Species Programs in Oregon and Washington and protection of five of the known sites by reserves, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Kurzia makinoana

This species has been reported from Washington, Oregon, and California. Currently there are four known sites. Nomenclature of this taxon is in question, so it is difficult to fully understand the range and distribution of this species within the Northwest Forest Plan area.

Under Alternatives 1 and 3, this species would be included in Category B which requires management of all known sites and strategic surveys. There is insufficient information to determine how these alternatives would affect distribution and stability of this species under Alternative 1 (USDA, USDI 2000a, p. 227) and Alternative 3. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, this species is assumed to be included as a Bureau Assessment species on Oregon/Washington BLM lands. It is assumed not to be included in the Forest Service Sensitive Species Programs in Washington, Oregon, or California, or the BLM Special Status Species Program in California. Due to lack of information for this species, there is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Marsupella emarginata var. *aquatica*

This aquatic species grows attached to rocks in streams. Until recently, the only known site for this species was on the Willamette National Forest. Recent proposive surveys located an additional site on the Mt. Baker-Snoqualmie National Forest. There has been taxonomic confusion over the acceptance of this taxon as being a valid variety.

Under Alternatives 1 and 3, this species would be included in Category B which requires management of all known sites and strategic surveys. Since this variety is restricted to aquatic habitats, Riparian Reserves may provide protection of habitat for this species. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a Bureau Assessment species on Oregon/Washington BLM lands. It is assumed not to be included in the Forest Service Sensitive Species Programs in Washington, Oregon, or California, or the BLM Special Status Species Program in California. Since this variety is restricted to aquatic habitats, Riparian Reserves may provide protection of habitat for this species. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Orthodontium gracile

This species occurs in southern Oregon and northern California. Current information indicates this species occurs predominately in coastal redwood forests, most of which are located in reserves, State, or National Parks.

Under Alternatives 1 and 3, this species would be included in Category B which requires management of all known sites and strategic surveys. Due to current information that this species is limited to coastal redwood forests, most of which are protected, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as Bureau Sensitive species on California BLM lands. It was assumed to not be included in the Forest Service Sensitive Species program in California. Due to current information that this species is limited to coastal redwood forests, most of which are protected, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Ptilidium californicum (CA only)

This species has a North Pacific distribution (USDA, USDI 2000a, p. 219). It reaches the southern extent of its range in northern California. Previously known only from the literature in California, there are now 228 known sites. Although it appears that there are a large number of sites, the majority of these records are the result of recent proposive surveys completed on the Klamath and Six Rivers National Forests. Roughly an equal percentage of the sites are in reserve and non-reserve allocations (USDA, USDI 2002). Because the majority of the known sites are on the above forests, it is not known if this species is well distributed in the state.

Under Alternatives 1 and 3, this species would be included in Category A in California which requires pre-disturbance surveys, management of all known sites, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Due to management of known sites and protection of known sites by reserve land allocations, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a Bureau Sensitive species for the California BLM and as a Sensitive Species for the Forest Service in Region 5. Due to inclusion in the Special Status Species Programs and protection of known sites by reserves, there would not be a high risk of extirpation for this species in the Northwest Forest Plan area under Alternative 2.

Racomitrium aquaticum

Most of the western North American material of this species has been proposed for a name change to *Racomitrium ryszardii.* It is a recent proposal that has not had time to be evaluated by the North American bryological community (USDA, USDI 2002). This genus is difficult to work

with, in general, and it is often misidentified or overlooked when collections are made. Contrary to this species' name (*aquaticum*), it is not an aquatic species (Harpel 2003, pers. comm.).

Under Alternatives 1 and 3, this species would be included in Category E which requires management of all known sites and strategic surveys. Due to low number of sites and difficulties in identification, there is insufficient information to determine how these alternatives would affect distribution and stability of this species under Alternative 1 (USDA, USDI 2000a, p. 230) or Alternative 3. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, this species is assumed not to be included in the Special Status Species Programs. Due to low number of sites and difficulties in identification, there is insufficient information to determine how the alternative would affect distribution and stability of this species. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Rhizomnium nudum

Although Koponen (1973) maps the distribution of this species as ending in Washington, new information has extended the range of this species into the Oregon Cascades as far south as the Umpqua National Forest. In Oregon, 3 of the 16 ISMS sites are in Late-Successional Reserves on National Forest System lands. Currently this species is not known from California.

Under Alternatives 1 and 3, this species would be included in Category B outside of Washington State. This requires management of all known sites and strategic surveys. Because known site management will contribute to providing for stable populations of this species, *Rhizomnium nudum* would stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 227). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as Bureau Assessment for the BLM in Oregon, but is assumed not to be included in the Forest Service Sensitive Species program in Oregon. There is a high risk of loss of sites on National Forest System lands in Oregon because *R. nudum* occurs on moist forest humus or soil, in coniferous forests mostly at mid to high elevation, sometimes near seepage areas. Because these types of areas do not meet the criteria to be classified under the riparian reserve designation it is difficult to assume that their persistence needs would be met in Oregon. This would lead to a high risk of extirpation in this portion of its range. However, the high number of sites in Late Successional Reserves in Washington should provide for the species persistence. There would not be a high risk of extirpation range-wide in the Northwest Forest Plan area for this species under Alternative 2

Schistostega pennata

This species occurs in Washington and Oregon with most of the sites found on the Olympic Peninsula, and in the Gifford Pinchot, Mt. Baker-Snoqualmie, and Mt. Hood National Forests. It is known as far south as the Umpqua National Forest in Oregon. New information indicates this species is found in a variety of habitats and is not restricted to riparian areas (Harpel 2003, pers. comm.).

Under Alternatives 1 and 3, this species would be included in Category A which requires pre-disturbance surveys, management of all known sites, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Due to management of known sites there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included in the Forest Service Region 6 Sensitive Species program. It is assumed to be Bureau Assessment in Oregon and Washington.

Due to management of known sites, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Tetraphis geniculata

This species occurs in Oregon and Washington and is suspected to be found in coastal California. Most of the known sites for this species occur in Washington on the Gifford Pinchot National Forest and the Olympic Peninsula. A substantial number of these sites occur outside of reserves. Only three locations are known to occur in Oregon. Because this species in the Pacific Northwest is dependent on decaying coarse woody debris, it is important to maintain these components within non-late-successional and non-old-growth forest stands.

Under Alternatives 1 and 3, this species would be included in Category A which requires pre-disturbance surveys, management of all known sites, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Due to management of known sites and strategic surveys, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as Bureau Sensitive on BLM lands in California and as Bureau Assessment in Oregon and Washington. It is also assumed to be included in the Forest Service Sensitive Species program in Oregon. This would provide for management of known sites and pre-project clearances in Oregon. This species is dependent on decaying logs and stumps (decay class 3, 4, or 5), which are transient resources, so dispersal to new substrate is critical to avoid local extirpation. Although the current standards and guidelines provide for the retention of existing coarse woody debris and the addition of 120 or 240 linear board feet, it does not specify that the decay class of the retained or added material needs to be at least decay class 3 or greater to meet the substrate requirements for this species. According to Kimmer (1991a and 1991b) resource depletion and environmental stress leads to a shift in male/female dominance in clumps of *Tetraphis* that results in a lower reproduction rate. A lower reproduction rate combined with the dispersal limitations brought about by changes in the method of reproduction would result in the loss of habitat and sites on National Forest System lands in Washington for those sites that do not occur in reserves. Since most sites occur on National Forest System lands in Washington, the potential loss of these sites would result in a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Tritomaria exsectiformis

Previously this species was thought to occur only on the eastside of the Cascade Mountains. New information from proposive surveys expanded the known range of the species on the eastside and to the Olympic National Forest on the westside of the Cascades. Currently all known sites occur on National Forest System lands.

Under Alternatives 1 and 3, this species would be in Category B which requires management of all known sites and strategic surveys. Due to few known sites and lack of information, there is insufficient information to determine how any alternative would affect the distribution and stability of *Tritomaria exsectiformis* (USDA, USDI 2000a, p. 227). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a Bureau Assessment species by the BLM in Oregon and Washington where known sites would be maintained. It is assumed not to be included in the Forest Service Sensitive Species Programs or in the BLM Special Status Species program in California. Although loss of sites could occur where not included in the Agencies' Special Status Species Programs, there is insufficient information to determine how the alternative would affect distribution and stability of this species. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Tritomaria quinquedentata

This species is known from few sites and current information indicates it is rare and limited in distribution (USDA, USDI 2000a, p. 230). There are 11 known sites for this species in Washington and 1 known site in Oregon. Eleven of 12 sites occur on federally managed lands. Several recent collections on the eastside of the Cascade Mountains have expanded the range from the Mt. Baker-Snoqualmie National Forest to the Okanogan National Forest in Washington. The association of this species with late-successional or old-growth forests is uncertain (USDA, USDI Species Review Panel 1999).

Under Alternatives 1 and 3, this species would be included in Category B which requires management of all known sites and strategic surveys. Because there are so few sites, there is insufficient information to determine how these alternatives would affect the distribution and stability of this species (USDA, USDI 2000a, p. 230). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included as a Bureau Assessment species by the Oregon/Washington BLM. It is assumed not to be included in the Forest Service Sensitive Species Program or the BLM Special Status Species Program in California. Because it is unknown how well the current information reflects species' distribution and there are so few sites, there is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Summary and Possible Mitigation

Under all alternatives, there would not be a high risk of extirpation in the Northwest Forest Plan area for eight species. Under all alternatives, there is insufficient information to draw a conclusion for six species. This results in no difference between the alternatives for 14 of the 15 species of bryophytes.

For one bryophyte (*Tetraphis geniculata*), there would not be a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3 while there would be a high risk for extirpation in the Northwest Forest Plan area under Alternative 2. Mitigation of these effects under Alternative 2 could include management of known sites not protected by reserves or the Agencies' Special Status Species Programs and pre-project clearances in Washington. These mitigations would eliminate the high risk of extirpation for this species. The mitigations would be implemented consistent with the Agencies' Special Status Species Programs. See chapter 2 for a detailed description of these programs.

Additionally under Alternative 2, two species (*Buxbaumia viridis* and *Rhizomnium nudum*) are not at high risk range-wide throughout the Northwest Forest Plan area, but are at high risk in important portions of their range. Mitigation of these effects under Alternative 2 could include management of known sites not protected by reserves or the Agencies' Special Status Species Programs. This mitigation would eliminate the high risk of extirpation for these species in the portion of their range that is at risk. The mitigation would be implemented consistent with the Agencies' Special Status Species Programs. See chapter 2 for a detailed description of these programs.

Fungi

Background and Affected Environment

Under Alternative 1, there are 189 fungi species currently included in the Survey and Manage Standards and Guidelines (see Table 2-8). Under Alternative 2, there would be 52 of these species included in the Agencies' Special Status Species Programs, and an additional 72 species are included as Bureau Tracking Species by the BLM Special Status Species Program (see Table 2-8). Under Alternative 3, there would be 174 species included in the Survey and Manage Standards and Guidelines (Categories A, B, and E) and one species (*Sparassis crispa*) would be included in the Agencies' Special Status Species Program (see Table 2-8).

Fungi are neither plants nor animals but are recognized as a separate kingdom of organisms, both in structure and function. Estimates indicate there are at least six species of fungi for every vascular plant species in a given temperate ecosystem (Hawksworth 1991). The fungal flora of the Pacific Northwest is extremely diverse. Of the 527 species of fungi that were evaluated as closely associated with late-successional and old-growth forests, 109 are known to be endemic to the Pacific Northwest.

Most macrofungi (mushrooms, truffles, and allies) produce fruiting structures or sporocarps that are short-lived and ephemeral, seasonal in occurrence, and annually variable. Richardson (1970) estimated that sampling every 2 weeks would fail to detect about 50 percent of macrofungal species fruiting in a season. On the average, less than 10 percent of species were detected in each of 2 consecutive years at any one of eight sites (O'Dell et al. 1999). The reasons for annual and seasonal variation are not fully understood, and predicting when, or under what conditions, a species would fruit is not possible at present.

Another poorly understood facet of fungi is their population biology. Dispersal, reproduction, and connectivity are not well understood for any of the fungi considered in this SEIS.

Environmental Consequences

Habitat components important to fungi include dead, down wood; standing dead trees; and live, old-growth trees; as well as a diversity of host species and microhabitats. Also important for fungi is a well-distributed network of late-successional forest. Small forest fragments can function as refugia where fungi may persist until suitable habitat conditions become available in adjacent stands. The analyses of environmental consequences of Option 9 in FEMAT and Alternative 9 in the Northwest Forest Plan Final SEIS concluded that alternatives, such as Alternative 9, which provide for more extensive and interconnected late-successional and old-growth forest conditions, would minimize the risks to these species (USDA, USDI 1994a, p. 3&4-136).

The Survey and Manage Final SEIS 2000 acknowledged a high degree of uncertainty regarding the biological distribution of fungi. This uncertainty has been reduced for some species as a result of a variety of efforts including strategic surveys implemented under the Survey and Manage Standards and Guidelines. Consequently, the environmental consequences analysis in this SEIS was able to reach conclusions for some species that previously lacked sufficient information to determine how any alternative would affect distribution and stability. For some other species, conclusions were modified from the Survey and Manage Final SEIS 2000 as a result of additional information. A primary source of information regarding the distribution and number of known sites used in the analysis of these species was the ISMS database.

Species are grouped for the purpose of comparing environmental consequences. The groupings are not intended to imply that this certain aspect of the analysis is the only criteria by which the

alternatives would be judged. Previous analyses, either incorporated by reference or supplemented by this SEIS, contain relevant information regarding the alternatives.

Although historic locations delineate potential species ranges, the following 44 species have not been recorded since institution of the Survey and Manage fungi lab in 1996. Under all alternatives, the following species would not maintain stable populations and would be at a high risk of extirpation within the Northwest Forest Plan area. The reasons for this outcome include the fact that many of these species have not been observed in the Northwest Forest Plan area in more than 30 years, many may already be extirpated from the Northwest Forest Plan area and all alternatives would provide insufficient habitat to maintain these species (USDA, USDI 2000a).

Albatrellus avellaneus
Arcangeliella crassa
Asterophora parasitica
Baeospora myriadophylla
Balsamia nigrens
Boletus haematinus
Cordyceps ophioglossoides
Cortinarius speciosissimus
Cortinarius umidicola
Cortinarius variipes
Cortinarius wiebeae
Cyphellostereum laeve
Destuntzia fusca
Destuntzia rubra
Dichostereum boreale
Elaphomyces anthracinus
Endogone acrogena
Endogone oregonensis
Fayodia bisphaerigera
Fevansia aurantiaca
Gastroboletus imbellus
Gastrosuillus umbrinus
Gautieria magnicellaris
Gautieria otthii
Glomus radiatum
Gymnomyces nondistincta
Hebeloma olympianum
Hydnotrya subnix
Hygrophorus vernalis
Macowanites lymanensis
Macowanites mollis
Martellia fragrans
Mythicomyces corneipes
Neolentinus adhaerens
Octavianina macrospora
Octavianina papyracea
Ramaria hilaris var. *olympiana*
Rhizopogon abietis
Rhizopogon brunneiniger
Rhizopogon ellipsosporus
Rhizopogon inquinatus
Sedecula pulvinata
Stagnicola perplexa
Thaxterogaster pavelekii.

Under all alternatives, the following 83 species would not maintain stable populations largely due to the very low number of occurrences (1 to 10 sites since 1996) and would be at a high risk of extirpation within the Northwest Forest Plan area (USDA, USDI 2000a, pp. 244-245).

Acanthophysium farlowii
Albatrellus caeruleoporus
Alpova alexsmithii
Alpova olivaceotinctus
Arcangeliella camphorata
Arcangeliella lactarioides
Asterophora lycoperdoides
Boletus pulcherrimus
Bridgeoporus nobilissimus
Catathelasma ventricosa
Chamonixia caespitosa
Choiromyces alveolatus
Choiromyces venosus
Chroogomphus loculatus
Chrysomphalina grossula
Clavariadelphus subfastigiatus
Clavulina castanopes var. *lignicola*
Clitocybe senilis
Clitocybe subditopoda
Collybia racemosa
Cortinarius boulderensis
Cortinarius cyanites
Cortinarius depauperatus
Cortinarius magnivelatus
Cortinarius olympianus
Cortinarius valgus
Cortinarius verrucisporus
Dermocybe humboldtensis
Elaphomyces subviscidus
Entoloma nitidum
Galerina cerina
Gastroboletus ruber
Gastroboletus turbinatus
Gastroboletus vividus

Gelatinodiscus flavidus
Gymnomyces abietis
Helvella crassitunicata
Hydnotrya inordinata
Hydropus marginellus
Hygrophorus caeruleus
Hygrophorus karstenii
Hypomyces luteovirens
Leucogaster microsporus
Macowanites chlorinosmus
Marasmius applanatipes
Martellia idahoensis
Mycena hudsoniana
Mycena quinaultensis
Mycena tenax
Neolentinus kauffmanii
Octavianina cyanescens
Otidea smithii
Phaeocollybia gregaria
Phellodon atratus
Pholiota albivelata
Podostoma alutaceum
Pseudaleuria quinaultiana
Ramaria abietina
Ramaria botrytis var. *aurantiiramosa*
Ramaria claviramulata
Ramaria concolor f. tsugina
Ramaria conjunctipes var. *sparsiramosa*
Ramaria coulterae
Ramaria gracilis
Ramaria maculatipes
Ramaria rainierensis
Ramaria rubella var. *blanda*
Ramaria rubribrunnescens
Ramaria spinulosa var. *diminutiva*
Ramaria suecica
Ramaria thiersii
Ramaria verlotensis
Rhizopogon atroviolaceus
Rhizopogon chamaleontinus
Rhizopogon evadens var. *subalpinus*
Rhizopogon exiguus
Rhizopogon flavofibrillosus
Rhodocybe speciosa
Rickenella swartzii
Tricholomopsis fulvescens
Tuber asa
Tuber pacificum
Tylopilus porphyrosporus.

For the following seven species, there is insufficient information to determine how the alternatives would affect distribution and stability or result in a high risk of extirpation within the Northwest Forest Plan area (USDA, USDI 2000a, p. 247).

Cortinarius tabularis
Galerina sphagnicola
Gastrosuillus amaranthii
Ramaria concolor f. marrii
Ramaria lorithamnus
Russula mustelina
Tricholoma venanatum

Under Alternative 1, the following 13 species would stabilize in a pattern similar to or different from their reference distribution and would not be at a high risk of extirpation within the Northwest Forest Plan area because their known sites would be protected through the Survey and Manage Standards and Guidelines. Under Alternative 2, these 13 species would stabilize in a pattern similar to or different from their reference distribution and would not be at a high risk of extirpation within the Northwest Forest Plan area because a substantial number of their known sites are located in reserves (USDA, USDI 2000a, p. 243 and ISMS database). Under Alternative 3, these 13 species would stabilize in a pattern similar to or different from their reference distribution and would not be at a high risk of extirpation within the Northwest Forest Plan area because their known sites would be protected through the Survey and Manage Standards and Guidelines or a substantial number of their known sites are located in reserves.

Bondarzewia mesenterica
Cantharellus subalbidus
Chalciporus piperatus
Clavariadelphus truncatus
Collybia bakerensis
Craterellus tubaeformis
Galerina atkinsoniana
Gastroboletus subalpinus
Helvella elastica
Mycena overholtsii
Nivatogastrium nubigenum
Otidea leporina
Phaeocollybia kauffmanii.

The following 18 species are not endemic to the Northwest Forest Plan area. For these species, Alternative 1 requires management of known sites and these species would stabilize in a pattern

similar to their reference distribution and would not be at high risk of extirpation within the Northwest Forest Plan area. However, within the Northwest Forest Plan area, due to overall low numbers of sites and low numbers of sites located in reserves, these species have limited potential for connectivity or gene flow between sites or clusters of sites. Under Alternative 2, these species would receive limited or no management of known sites through the Special Status Species Programs. Because the known sites of these species are not otherwise substantially protected by reserves, these species would be at high risk of extirpation in the Northwest Forest Plan area, due to soil disturbance and/or significant loss of host species (USDA, USDI 2000a, p. 243, and ISMS database). Alternative 3 would require management of known sites for 14 of these 18 species. Under Alternative 3, these 14 species would stabilize in a pattern similar to their reference distribution and would not be at high risk of extirpation within the Northwest Forest Plan area. Under Alternative 3, management of known sites is not required through either Survey and Manage or the Special Status Species programs for 4 of the 18 species (*Gomphus clavatus*, *Rhizopogon truncatus*, *Sparassis crispa*, and *Tremiscus helvelloides*). Because the known sites of these four species are not otherwise substantially protected by reserves, these species would be at high risk of extirpation in the Northwest Forest Plan area, due to soil disturbance and/or significant loss of host species (USDA, USDI 2000a, p. 243 and ISMS database).

Albatrellus ellisii
Albatrellus flettii
Clavariadelphus ligula
Clavariadelphus occidentalis
Clavariadelphus sachalinensis
Cortinarius barlowensis
Galerina heterocystis
Gomphus bonarii
Gomphus clavatus
Phaeocollybia scatesiae
Polyozellus multiplex
Ramaria cyaneigranosa
Ramaria rubrievanescens
Rhizopogon truncatus
Spathularia flavida
Sowerbyella rhenana
Sparassis crispa
Tremiscus helvelloides.

The following 24 species are endemic to the Northwest Forest Plan area. Alternative 1 requires management of known sites. These species would stabilize in a pattern similar to their reference distribution and would not be at high risk of extirpation within the Northwest Forest Plan area. However, due to overall low numbers of sites and low numbers of sites located in reserves, these species have limited potential for connectivity or gene flow between sites or clusters of sites. Under Alternative 2, these species would receive limited or no management of known sites on federally managed lands through the Special Status Species Programs and/or there are a low number of sites located in reserves. Because the known sites of these species are not otherwise substantially protected by reserves, these species would be at high risk of extirpation in the Northwest Forest Plan area due to soil disturbance and/or significant loss of host species (USDA, USDI 2000a, p. 243 and ISMS database). Alternative 3 requires management of known sites for 21 of these 24 species. Under Alternative 3, these 21 species would stabilize in a pattern similar to their reference distribution and would not be at high risk of extirpation within the Northwest Forest Plan area. Under Alternative 3, management of known sites would not occur through either Survey and Manage or the Special Status Species programs for 3 (*Phaeocollybia attenuata*, *Phaeocollybia olivacea*, and *Ramaria rubripermanens*) of the 24 species in either all or a significant portion of their range. Because the known sites of these three species are not otherwise substantially protected by reserves, these species would be at high risk of extirpation in the Northwest Forest Plan area, due to soil disturbance and/or significant loss of host species (USDA, USDI 2000a, p. 243 and ISMS database).

Cudonia monticola
Gomphus kauffmanii
Gymnopilus punctifolius
Gyromitra californica
Leucogaster citrinus
Phaeocollybia attenuata
Phaeocollybia californica
Phaeocollybia dissiliens
Phaeocollybia fallax
Phaeocollybia olivacea
Phaeocollybia oregonensis
Phaeocollybia piceae
Phaeocollybia pseudofestiva
Phaeocollybia sipei
Phaeocollybia spadicea
Ramaria amyloidea

Ramaria aurantiisiccescens
Ramaria largentii
Ramaria araiospora
Ramaria gelatiniaurantia
Ramaria rubripermanens
Ramaria celerivirescens
Ramaria stuntzii
Sarcodon fuscoindicus.

Summary and Possible Mitigation

Under Alternatives 1, 2, and 3, there is insufficient information to determine an outcome for 7 species.

Alternative 1: 55 species would be stable and not at high risk of extirpation, while 127 species would be at high risk of extirpation within the Northwest Forest Plan area.

Alternative 2: 13 species would be stable and not at high risk of extirpation, while 169 species would be at high risk of extirpation within the Northwest Forest Plan area.

Alternative 3: 48 species would be stable and not at high risk of extirpation, while 134 species would be at high risk of extirpation within the Northwest Forest Plan area.

Under all alternatives, 127 of 189 fungi species would not maintain stable populations and would be at high risk of extirpation within the Northwest Forest Plan area. Mitigation would not substantially alter this outcome for these 127 species because this outcome is not a result of federal actions.

Under Alternative 1, 55 of 189 fungi species would stabilize in a pattern similar to their reference distribution and would not be at a high risk of extirpation within the Northwest Forest Plan area.

Mitigation would improve the outcome for some species under both Alternatives 2 and 3. Under Alternative 2, 42 of 55 species would be at a high risk of extirpation within the Northwest Forest Plan area. Mitigation that consists of managing known sites would eliminate the high risk of extirpation within the Northwest Forest Plan area for 42 species under Alternative 2. This mitigation would be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

Under Alternative 3, 48 of 55 species would stabilize in a pattern similar to their reference distribution and would not be at a high risk of extirpation within the Northwest Forest Plan area. For the remaining seven species they would be at a high risk of extirpation within the Northwest Forest Plan area because they are not included in the Survey and Manage or Special Status Species Programs. Mitigation that consists of managing known sites would eliminate the high risk of extirpation within the Northwest Forest Plan area for seven species under Alternative 3. See Chapter 2 for a detailed description of these programs.

Lichens

Background and Affected Environment

Lichens are symbiotic organisms made of members of at least two, and sometimes three, biological kingdoms. All lichens consist of a photosynthetic component (either a green alga or a cyanobacterium, and occasionally both), and a fungal component (usually an ascomycete).

The distribution of many lichens is dispersal limited (USDA et al. 1993). Overall, lichens disperse and grow more slowly than vascular plants. Many of the lichens in the Survey and Manage Standards and Guidelines have narrow ecological amplitude. Many of the forest species

are epiphytic, growing directly on trees and shrubs, but some grow on downed wood or soil, or are aquatic and are partially submerged at least part of the year. Lichens often occupy late-successional and old-growth components that provide continuity in younger stands, such as legacy trees, wolf trees, well-developed hardwood gaps, and dynamic riparian areas with an old alder component. Some of the Northwest Forest Plan Standards and Guidelines, such as green tree retention and riparian buffers, can be effective for lichens if clumps of colonized trees are retained to act as "seed" sources when habitat conditions become suitable again. FEMAT states that riparian buffers on all orders of streams are important for the riparian and aquatic lichens (USDA et al. 1993, p. IV-97).

At the time of the Northwest Forest Plan Final SEIS (1994), there was little information about the distribution, number of sites, and habitat requirements for most of the lichens. New information has contributed substantially to the understanding of many species' frequency and distribution throughout the Northwest Forest Plan area. Most of this information is a direct result of pre-disturbance and strategic surveys, statistical analyses of data from Oregon National Forests in the Northwest Forest Plan area and the Gifford Pinchot National Forest in Washington (Edwards et al. 2002), and the Coastal Lichen Study (Glavich et al. 2002). The historic distribution of these species is unknown and can only be inferred.

Additional information regarding the background and affected environment for lichens is found in the Survey and Manage Final SEIS 2000, the Northwest Forest Plan Final SEIS, and FEMAT.

Lichen Functional Groups

In the Option 9 and Alternative 9 analyses, lichens were grouped into 12 functional groups based on ecological relationships. Some of these groups were subdivided by their degree of rarity (USDA et al. 1993, p. IV-92). Additional information since these analyses has further refined membership within functional groups, and has also indicated that some functional affinities might not be as strong as once suspected. Although lichens are not analyzed by functional groups here, a brief description of the modified functional groups is presented below. This is not intended as a formal definition of functional groups, a task that is beyond the scope of this analysis. Each species is analyzed individually.

Coastal Lichens

The coastal lichen group includes *Bryoria pseudocapillaris, Bryoria subcana, Bryoria spiralifera, Buellia oidalea, Heterodermia sitchensis, Hypotrachyna revoluta, Niebla cephalota, Pannaria rubiginosa, Teloschistes flavicans,* and *Usnea hesperina*.

New information from the Coastal Lichen Study (Glavich et al. 2002) and ISMS confirm all of the coastal lichens are still considered rare and have narrow ecological amplitudes in limited habitat. None of these species are well represented in the reserves.

Riparian Lichens

The riparian lichen group includes *Cetrelia cetrarioides* and *Collema nigrescens.*

New information indicates some riparian enhancement projects, especially hardwood removal to promote conifer development, may disturb habitat for riparian lichens. Riparian hardwoods can be an important substrate for these species.

Ambiguous Riparian Association Lichens

This group includes lichens whose riparian association is in question. The ambiguous riparian association lichens include *Leptogium cyanescens, Leptogium teretiusculum, Platismatia lacunosa, Ramalina thrausta,* and *Usnea longissima*.

Aquatic Lichens

The aquatic lichen group includes *Dermatocarpon luridum* and *Leptogium rivale.*

Aquatic lichens are truly aquatic and are submerged at least part of the year. The Aquatic Conservation Strategy was designed to address all elements of the aquatic and riparian ecosystem. FEMAT states that riparian buffers on all orders of streams are important for the riparian and aquatic lichens (USDA et al. 1993, p. IV-97). New information indicates some riparian enhancement projects may disturb habitat for aquatic and riparian lichens.

Rare and Uncommon Nitrogen-Fixing Lichens

This group includes *Dendriscocaulon intricatulum, Lobaria linita, Lobaria oregana* (CA), *Nephroma bellum, Nephroma isidiosum, Nephroma occultum, Peltigera pacifica, Pseudocyphellaria perpetua,* and *Pseudocyphellaria rainierensis.*

These cyanolichens fix atmospheric nitrogen and make it usable to other components of the ecosystem.

Pin Lichens

The pin lichen group includes *Calicium abietinum, Calicium adspersum, Chaenotheca chrysocephala, Chaenotheca ferruginea, Chaenotheca furfuracea, Chaenotheca subroscida, Chaenothecopsis pusilla, Microcalicium arenarium,* and *Stenocybe clavata*.

This is a group of small, easily overlooked species. Strategic surveys have yielded new information on the rarity, distribution, and habitat association for many of these species.

Other Lichens

Four species did not fit into any of the other groupings. They are *Cladonia norvegica, Hypogymnia duplicata, Hypogymnia vittata,* and *Tholurna dissimilis.*

Lichens of Taxonomic Concern

Two lichens, *Fuscopannaria* (*Pannaria*) *saubinetii* (a coastal lichen), and *Leptogium burnetiae* var. *hirsutum* are lichens with taxonomic concerns.

Environmental Consequences

Under Alternative 1, there are 43 lichen species that remain in the Survey and Manage Standards and Guidelines (see Table 2-8).

Under Alternative 2, there are 28 lichens species assumed to be included in the Agencies' Special Status Species Programs (see Table 2-8).

Under Alternative 3, there are 39 species included in the Survey and Manage Standards and Guidelines (Categories A, B, or E). Three additional species are assumed to be included in the Agencies' Special Status Species Programs (see Table 2-8). Management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys for 12 species in Survey and Manage Category A. Late-successional, old-growth legacy components in younger stands provide important refugia and propagule sources to re-colonize younger stands. While surveys in these important legacy components would not be completed in younger stands for these 12 species, existing Northwest Forest Plan Standards and Guidelines for Matrix management (USDA, USDI 1994b, pp. C-39 through C-48) provide for retention of these legacy components.

Under all alternatives, some of the lichen species would receive protection under the network of reserves provided by the Northwest Forest Plan. The level of protection varies, by species, depending on how many sites and what proportions of the known sites are in reserves. Few statistical analyses have been done on the association between reserve allocations and lichens. Seven lichens (*Buellia oidalea*, *Lobaria oregana*, *Nephroma isidiosum*, *Nephroma occultum*, *Peltigera pacifica*, *Pseudocyphellaria rainierensis*, and *Stenocybe clavata*) are Pacific Northwest endemics. FEMAT stated that "extirpation of these species in the region would equate to the extinction of the species" (USDA, USDI 1993, p. IV-90). Three lichens, *Heterodermia sitchensis*, *Hypogymnia vittata*, and *Nephroma isidiosum* are suspected but not documented in the Northwest Forest Plan area.

The Northwest Forest Plan Final SEIS concluded that several alternatives including Alternative 9 were most favorable to lichens because they provided the set of allocations and management practices that best produce habitat components for lichens (USDA, USDI 1994a, p. 3&4-145). In the Matrix, management that could provide suitable habitat for lichens includes clumping leave trees within managed stands and retaining old-growth fragments where little exists (USDA et al. 1993, p. IV-97). Colonized forest fragments act as refugia for lichens that become future propagule sources as suitable habitat conditions develop in the surrounding managed stand. Several of the rare late-successional and old-growth forest related lichens, including *Hypogymnia duplicata*, *Nephroma occultum*, and *Pseudocyphellaria rainierensis* are dispersal limited.

Bryoria pseudocapillaris

Bryoria pseudocapillaris is rare with five known sites on federally managed lands in Oregon and northern California. Only one of these sites is found in a reserve land allocation. There is one known site on nonfederal land in Washington.

Under Alternatives 1 and 3, *Bryoria pseudocapillaris* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 293). Due to limited potential habitat and few populations on federally managed lands and the potential for stochastic events, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Bryoria pseudocapillaris* is assumed be included in the Agencies' Special Status Species Programs except for the Forest Service in California where there is suitable habitat

under Forest Service management at only one location. This species would not maintain stable populations and/or distributions under Alternative 2 due to limited potential habitat and few populations on federally managed lands and the potential for stochastic events. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Bryoria spiralifera

Bryoria spiralifera is rare and occurs in Oregon and northern California. No sites have been found in reserve land allocations. Current information still indicates this lichen is rare in the Northwest Forest Plan area, with low number of known sites, low numbers of individuals, limited distribution, and narrow ecological amplitude (USDA, USDI 2000a, p. 290).

Under Alternatives 1 and 3, *Bryoria spiralifera* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 293). Due to limited potential habitat and few populations on federally managed lands and the potential for stochastic events, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Bryoria spiralifera* is assumed be included in the Agencies' Special Status Species Programs except for the Forest Service in California where there is little suitable habitat under Forest Service management. This species would not maintain stable populations and/or distributions under Alternative 2 due to limited potential habitat and few populations on federally managed lands and the potential for stochastic events. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Bryoria subcana

Bryoria subcana, which was previously thought to be strictly coastal (USDA, USDI 1994a), is now also known to occur at a few sites in the Western Cascades (Glavich et al. 2002). This species is still considered to be rare with only one site in a reserve.

Under Alternatives 1 and 3, *Bryoria subcana* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 293). Due to limited potential habitat and few populations on federally managed lands and the potential for stochastic events, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Bryoria subcana* is assumed be included in the Special Status Species program for the BLM in Oregon and Washington. This species would not maintain stable populations and/or distributions under Alternative 2 due to limited potential habitat and few populations on federally managed lands and the potential for stochastic events. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Buellia oidalea

Buellia oidalea is very rare in the Northwest Forest Plan area. There is high concern for this species due to low numbers of known sites, low number of individuals, limited distribution, and narrow ecological amplitudes (USDA et al. 1993; USDA, USDI 1994b, Appendix J2; USDA, USDI 2000a; and USDA, USDI Species Review Panel 1999). It was not detected during the Coastal Lichen Study (Glavich et al. 2002).

Under Alternatives 1 and 3, *Buellia oidalea* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 307). Due to low numbers of known sites, low number of individuals, limited

distribution, and narrow ecological amplitudes, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Buellia oidalea* is assumed not to be included in the Agencies' Special Status Species Programs. This species would not maintain stable populations and/or distributions under Alternative 2 due to low numbers of known sites, low number of individuals, limited distribution, and narrow ecological amplitudes. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Calicium abietinum

Calicium abietinum occurs in all three states. Information is still limited on the distribution, ecology, and abundance of this species in the Northwest Forest Plan area (USDA, USDI Species Review Panel 1999 and 2000).

Under Alternatives 1 and 3, *Calicium abietinum* would receive management of known sites and strategic surveys. There is insufficient information to determine how distribution and stability of this species would be affected (USDA, USDI 2000a, p. 290). Due to limited information on the distribution, ecology, and abundance of this species in the Northwest Forest Plan area, there is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Calicium abietinum* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information to determine how the alternative would affect distribution and stability of this species due to limited information on its distribution, ecology, and abundance in the Northwest Forest Plan area. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Calicium adspersum

Calicium adspersum is still poorly known in the Northwest Forest Plan area (USDA, USDI 2000a, p. 301). Although there are sites on non-federal lands, there are no known sites on federally managed land.

Under Alternatives 1 and 3, *Calicium adspersum* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 303). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Calicium adspersum* is assumed be included in the Agencies' Special Status Species Programs as Bureau Assessment for the BLM in Oregon and Washington and as Sensitive for the Forest Service in California. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Cetrelia cetrarioides

Cetrelia cetrarioides is a riparian lichen that frequently occurs on large, old riparian hardwoods. It is considered rare and is found in Washington and Oregon. It is assumed to be protected by Riparian Reserves; however, riparian enhancement projects that remove large, old hardwoods may disturb habitat for this lichen.

Under Alternatives 1 and 3, *Cetrelia cetrarioides* would receive management of known sites and strategic surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 305). Due to management of known sites, pre-project clearances, and protection

by reserves, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Cetrelia cetrarioides* is assumed be included in the Special Status Species Program for the Forest Service in Washington. This species would maintain stable populations and/or distributions under Alternative 2 due to management of known sites, pre-project clearances, and protection by reserves. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Chaenotheca chrysocephala

Chaenotheca chrysocephala is rare and is reported from Washington and California. There is still limited information on the distribution, ecology, and abundance of this species in the Northwest Forest Plan area (USDA, USDI Species Review Panel 1999 and 2000).

Under Alternatives 1 and 3, *Chaenotheca chrysocephala* would receive management of known sites and strategic surveys. There is insufficient information for this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 290). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Chaenotheca chrysocephala* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information for this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Chaenotheca ferruginea

Chaenotheca ferruginea is rare and occurs in all three states. There is still limited information on the distribution, ecology, and abundance of this species in the Northwest Forest Plan area (USDA, USDI Species Review Panel 1999 and 2000), and uncertainty regarding its association with late-successional or old-growth forests.

Under Alternatives 1 and 3, *Chaenotheca ferruginea* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 290). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Chaenotheca ferruginea* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Chaenotheca furfuracea

Chaenotheca furfuracea is more common and widespread than known at the time of the FEMAT analysis (USDA et al. 1993 and USDA, USDI Species Review Panel 1999 and 2000). This species has a broad global distribution (Tibell 1975). The reserve land allocations and other standards and guidelines of the Northwest Forest Plan may provide a reasonable assurance of stable populations on federally managed lands (USDA, USDI Species Review Panel 1999 and 2000).

Under Alternative 1, *Chaenotheca furfuracea* would receive strategic surveys. This species would maintain stable populations and/or distributions under Alternative 1 (USDA, USDI 2000a, p. 313). Due to protection by reserve land allocations and other standards and guidelines of the Northwest Forest Plan, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 1.

Under Alternatives 2 and 3, *Chaenotheca furfuracea* is assumed be included in the BLM Special Status Species program in California. This species would maintain stable populations and/or distributions under Alternatives 2 and 3 due to management of known sites, pre-project clearances, reserve land allocations, and other Northwest Forest Plan Standards and Guidelines. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 2 and 3.

Chaenotheca subroscida

Formerly, *Chaenotheca subroscida* was poorly known in the Northwest Forest Plan area and it was unknown if the species was even present (USDA, USDI 2000a, p. 301). This species has been confirmed in the Northwest Forest Plan area. There are only four known sites in ISMS for *Chaenotheca subroscida*. New information suggests that there is a high risk of extirpation for this species due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands.

Under Alternatives 1 and 3, *Chaenotheca subroscida* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distribution (USDA, USDI 2000a, p. 303). Due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Chaenotheca subroscida* is assumed be included in the Sensitive Species Program for the Forest Service in Oregon and Washington. This species would not maintain stable populations and/or distribution under Alternative 2 due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Chaenothecopsis pusilla

Formerly, *Chaenothecopsis pusilla* was poorly known in the Northwest Forest Plan area and it was unknown if these species were even present (USDA, USDI 2000a, p. 301). This species has been confirmed in the Northwest Forest Plan area. There are only three sites in ISMS for *Chaenothecopsis pusilla*. New information indicates there is a high risk of extirpation for this species due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands.

Under Alternatives 1 and 3, *Chaenothecopsis pusilla* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 303). Due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Chaenothecopsis pusilla* is assumed not to be included in the Agencies' Special Status Species Programs. This species would not maintain stable populations and/or distributions under Alternative 2 due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Cladonia norvegica

Cladonia norvegica is considered to be rare. Little is known about this species' distribution, habitat, or abundance in the Northwest Forest Plan area (USDA, USDI 2000a, p. 287).

Under Alternatives 1 and 3, *Cladonia norvegica* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 288). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Cladonia norvegica* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Collema nigrescens

Collema nigrescens is a riparian lichen. It occurs primarily on deciduous trees and shrubs and occasionally mossy rock, mainly west of the Cascades (McCune and Geiser 1997 and USDA, USDI Species Review Panel 1999). It is included in the Survey and Manage Standards and Guidelines only for Washington and Oregon, except for the Oregon Klamath Physiographic Provinces where there are relatively few documented sites (USDA, USDI 2000a, p. 269). Elsewhere (Oregon and California Klamath Provinces and California Coast Range Province) the number of known sites has increased and many sites are in reserve allocations (USDA, USDI 2000a, p. 269). In this part of its range where it is more common, there is a reasonable assurance of persistence as indicated by its widespread distribution, abundance, and by the number of known sites and availability of potential habitat in reserve land allocations (USDA, USDI, Species Review Panel 1999).

Under Alternative 1, *Collema nigrescens* would receive strategic surveys. In Washington and Oregon (except for the Oregon Klamath Province) there is insufficient information to determine how this alternative affects distribution and stability (USDA, USDI 2000a, p. 271). Due to abundance elsewhere in the Northwest Forest Plan area, this species would maintain stable populations and/or distributions under Alternative 1. There is not a high risk of extirpation range-wide in the Northwest Forest Plan area under Alternative 1.

Under Alternatives 2 and 3, *Collema nigrescens* is assumed be included in the Sensitive Species program for the Forest Service in Washington. In Washington and Oregon (except for the Oregon Klamath Province) there is insufficient information to determine how these alternatives affect distribution and stability. Due to abundance elsewhere in the Northwest Forest Plan area, there is not a high risk of extirpation range-wide in the Northwest Forest Plan area under Alternatives 2 and 3.

Dendriscocaulon intricatulum

Dendriscocaulon intricatulum occurs from southeast Alaska to northern California. It is rare in most of its range (except in southern Oregon, where it occupies a different habitat). Its range is centered in southern Oregon (Coos, Curry, Douglas, Jackson, and Josephine Counties), where it is common and may not be old-growth associated. This species has been removed from the Survey and Manage mitigation measure in southern Oregon where it is common. This analysis only pertains to the few populations in Washington, northern Oregon, and northern California, where it is rare. In Washington, most sites are on federally managed lands and few sites are in reserve allocations (USDA, USDI 2000a, p. 294).

Under Alternatives 1 and 3, *Dendriscocaulon intricatulum* would be included in the Survey and Manage Standards and Guidelines except in Oregon's Coos, Curry, Douglas, Jackson, and Josephine Counties. Under Alternatives 1 and 3, this species would receive management of known sites, pre-disturbance surveys, and strategic surveys in Washington and in Oregon (outside of Coos, Curry, Douglas, Jackson, and Josephine Counties). Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Late-successional, old-growth legacy components in younger stands provide

important refugia and propagule sources to re-colonize younger stands. While surveys in these important legacy components would not be completed in younger stands for this species, existing Northwest Forest Plan Standards and Guidelines for Matrix management provide for retention of these legacy components. *Dendriscocaulon intricatulum* would receive management of known sites and strategic surveys in the California portion of its range. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 295). Due to management of known sites, pre-disturbance surveys, strategic surveys, and species abundance in southern Oregon, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Dendriscocaulon intricatulum* is assumed to be included in the Special Status Species program for the Forest Service in Washington and the BLM in California. Outside of southern Oregon (Coos, Curry, Douglas, Jackson, and Josephine Counties), there is a high risk of loss of known sites on Forest Service managed lands in Oregon and California and BLM lands in Oregon and Washington where not protected by reserves. Given the low number of sites outside southern Oregon, this loss of sites would reduce stability and distribution of populations resulting in a high risk of extirpation in this portion of its range. However, due to management of known sites, pre-project clearances and species abundance in southern Oregon, there is not a high risk of extirpation range-wide in the Northwest Forest Plan area under Alternative 2.

Dermatocarpon luridum

Dermatocarpon luridum occurs in all three states and is known from less than 20 sites in the Northwest Forest Plan area. It is an aquatic lichen with a broad global distribution (USDA, USDI 2000a). Although some enhancement projects within Riparian Reserves can disturb habitat for this species (culvert removal, in-stream structure placement), it is assumed that the Aquatic Conservation Strategy would lower the risk of loss of sites (USDA, USDI 2000a, p. 297).

Under Alternatives 1 and 3, *Dermatocarpon luridum* would receive management of known sites and strategic surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 297). Due to management of known sites, strategic surveys, and protection by the Riparian Reserve network, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Dermatocarpon luridum* is assumed be included in the Forest Service Sensitive Species program in Oregon and Washington. This species would maintain stable populations and/or distributions under Alternative 2 due to management of known sites, pre-project clearances, and protection by the Riparian Reserve network. There would not be a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Fuscopannaria (Pannaria) saubinetii

Fuscopannaria (*Pannaria*) *saubinetii* was formerly thought to be a common, widespread species. North American lichens in the family Pannariaceae have recently been revised, including lichens in the genus *Pannaria* (Jorgensen 2000). Material formerly called *Pannaria saubinetii* has been moved to the genus *Fuscopannaria* (Jorgensen 2000). *Fuscopannaria saubinetii* is a rare species and only a few correctly identified specimens have been located to date (Jorgensen 2000). Although once believed to be a coastal species, examination of this material may prove otherwise. Until the taxonomic ambiguities can be resolved for *Fuscopannaria* (*Pannaria*) *saubinetii*, sites with vouchers being worked on are managed as known sites.

Under Alternative 1, this species would receive strategic surveys. Although it was thought that this species would maintain stable populations and/or distributions under Alternative 1 due to species abundance (USDA, USDI 2000a, p. 309), new information indicates this is a rare species. Due to low numbers, there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1.

Under Alternatives 2 and 3, this species is assumed not to be included in the Agencies' Special Status Species Programs. This species would not maintain stable populations and/or distributions under Alternatives 2 or 3 due to low numbers. There is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 2 and 3.

Heterodermia sitchensis

Heterodermia sitchensis is suspected but not documented in the Northwest Forest Plan area. It could occur along the immediate coast. It was not encountered on the Coastal Lichen Study plots (Glavich et al. 2002). Little is known of this species and its status is undetermined. Until recently, it was uncertain if this species is closely associated with late-successional or old-growth forests (USDA, USDI 2000a, p. 299). However, new information shows that this species is associated with old-growth at Cape Lookout, where it was found on fallen branches beneath enormous Sitka spruce and western hemlock (McHenry and Tonsberg 2002).

Under Alternatives 1 and 3, *Heterodermia sitchensis* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 301). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Heterodermia sitchensis* is assumed to be included in the BLM Special Status Species Program as Bureau Assessment in Oregon and Washington. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Hypogymnia duplicata

Hypogymnia duplicata is a Pacific Northwest endemic. It occurs from Alaska to northwestern Oregon. There are relatively high numbers of sites on the Mt. Baker-Snoqualmie National Forest. Concerns for this species have decreased in northern Washington because of the increase in number of known sites, although it is still restricted to specific habitat conditions and considered to be poorly distributed and rare (USDA, USDI 2000a). Most sites in Washington are protected (ISMS database). These populations are clustered and not well distributed across the landscape (Lesher 2002, pers. comm.). It is rare in the rest of its range.

Under Alternative 1, *Hypogymnia duplicata* would receive management of high-priority sites, pre-disturbance surveys, and strategic surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 282). Due to management of high-priority sites, pre-disturbance surveys, strategic surveys, and protection by reserve land allocations, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 1.

Under Alternatives 2 and 3, *Hypogymnia duplicata* is assumed be included in the Sensitive Species program for the Forest Service in Oregon. There are several sites on BLM managed lands in Oregon. These sites fall within Areas of Critical Ecological Concern (ACEC) where management activity is limited. This species would maintain stable populations and/or distributions under Alternatives 2 and 3 due to management of known sites, pre-project clearances, and protection by reserve land allocations and ACECs. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 2 and 3.

Hypogymnia vittata

Hypogymnia vittata occurs in southern British Columbia and in forested habitat in southeast Alaska (Geiser et al. 1998) that is similar to habitat in the Northwest Forest Plan area. It is suspected to occur in the North Cascades, and could be present in other parts of the Northwest Forest Plan area. Because it is not yet known here, little is known of this species in the Northwest

Forest Plan area and its status is undetermined. In addition, it is uncertain if this species is closely associated with late-successional or old-growth forests (USDA, USDI 2000a, p. 299).

Under Alternatives 1 and 3, *Hypogymnia vittata* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 301). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Hypogymnia vittata* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Hypotrachyna revoluta

Hypotrachyna revoluta was not rated by the FEMAT lichen panel because there was insufficient information at that time (USDA et al. 1993 and USDA, USDI 2000a, p. 299). This species was included in the Survey and Manage Standards and Guidelines because of persistence concerns since it was thought to be rare (USDA, USDI 1994b, Appendix J2). Since then, new information from more than 160 surveys in suitable habitat has only detected 2 additional known sites of *Hypotrachyna revoluta* (Glavich et al. 2002). This new information suggests that there is a high risk of extirpation for this species due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands.

Under Alternatives 1 and 3, *Hypotrachyna revoluta* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 301). Due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Hypotrachyna revoluta* is assumed be included in the Agencies' Special Status Species program for the Forest Service and BLM in Oregon and Washington. This species would not maintain stable populations and/or distributions under Alternative 2 due to extremely low numbers, limited distributions and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Leptogium burnetiae var. *hirsutum*

For *Leptogium burnetiae* var. *hirsutum*, pre-disturbance surveys have yielded vouchers that are taxonomically indistinct, based on current keys and species descriptions. This species is known from few sites on federally managed land (USDA, USDI 2000a, p. 283).

Under Alternatives 1 and 3, *Leptogium burnetiae* var. *hirsutum* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 305). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Leptogium burnetiae* var. *hirsutum* is assumed to be included in the Sensitive Species Program for the Forest Service in Washington and Oregon. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Leptogium cyanescens

Leptogium cyanescens is rare and occurs in all three states. Because it is known from few sites on federally managed land, there is a high concern for this species (USDA, USDI 2000a, p. 283). New information has only increased the number of known sites from one (Appendix J2, p. J2-239) to eight (ISMS database, December 2002).

Under Alternatives 1 and 3, *Leptogium cyanescen*s would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 284). Due to extremely low numbers, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Leptogium cyanescens* is assumed be included in the Sensitive Species program for the Forest Service in Washington and Oregon. This species would not maintain stable populations and/or distributions under Alternative 2 due to extremely low numbers. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Leptogium rivale

Leptogium rivale occurs in all three states. It is an aquatic lichen endemic to western North America and most known sites are on federally managed lands within Riparian Reserves (USDA, USDI 2000a, p. 296). Although some enhancement projects within Riparian Reserves can disturb habitat for this species (culvert removal, in-stream structure placement), the Aquatic Conservation Strategy would lower the risk of loss of sites (USDA, USDI 2000a, p. 297).

Under Alternatives 1 and 3, *Leptogium rivale* would receive management of known sites and strategic surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 297). Due to management efforts under Survey and Manage and protection by Riparian Reserves, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Leptogium rivale* is assumed not to be included in the Agencies' Special Status Species Programs. This species would maintain stable populations and/or distributions under Alternative 2 due to protection by Riparian Reserves. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Leptogium teretiusculum

Leptogium teretiusculum is rare and occurs in Oregon and California only. It is poorly known in the Northwest Forest Plan area (USDA, USDI 2000a, p. 303). It is uncertain if it is closely associated with late-successional or old-growth forests (USDA, USDI 2000a, p. 303). New information based on broad regional surveys has only increased the number of known sites from one (Appendix J2, p. J2-240) to seven (ISMS database, December 2002). This new information suggests that there is a high risk of extirpation for this species due to rarity, limited distribution and populations, few populations on federally managed lands, or limited suitable habitat on federally managed lands.

Under Alternatives 1 and 3, *Leptogium teretiusculum* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distribution (USDA, USDI 2000a, p. 305). Due to rarity, limited distribution and populations, few populations on federally managed lands, and limited suitable habitat on federally managed lands, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Leptogium teretiusculum* is assumed not to be included in the Agencies' Special Status Species Programs. This species would not maintain stable populations and/

or distributions under Alternative 2 due to rarity, limited distribution and populations, few populations on federally managed lands, and limited suitable habitat on federally managed lands. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Lobaria linita

Lobaria linita occurs sporadically in northern Europe and Asia, and is known to occur in North America from Alaska to Oregon (USDA, USDI 2000a, p. 280). The majority of known sites in the Northwest Forest Plan area are in northwest Washington (USDA, USDI 2000a, p. 280). There are currently 175 known sites (ISMS database), most of which are on the Mt. Baker-Snoqualmie National Forest. These populations reflect the results of several years of field tests of a predictive model. Populations are clustered and not well distributed across the landscape. The numbers of individuals at most sites is low (Lesher 2002, pers. comm.). *Lobaria linita* is uncommon in Washington north of Snoqualmie Pass where most sites are in reserves on the Mt. Baker-Snoqualmie National Forest. It is rare south of the pass and its presence in reserve allocation in this part of its range is unknown.

Under Alternatives 1 and 3, *Lobaria linita* is included in the Survey and Manage Standards and Guidelines for all of its range except for the Olympic Peninsula and the western Cascades north of Snoqualmie Pass in Washington. It would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 282). Due to management of known sites, pre-disturbance surveys, strategic surveys, and protection by reserves, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Lobaria linita* is assumed be included in the Agencies' Special Status Species Programs for the Forest Service in Oregon and the BLM in Oregon and Washington. This species would maintain stable populations and/or distributions under Alternative 2 due to protection by reserves, management of known sites, and pre-project clearances. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Lobaria oregana

Lobaria oregana is endemic to western North America (Goward et al. 1994 and McCune and Geiser 1997). It is currently included in the Survey and Manage mitigation measure in California where it is rare and reaches the southern extent of its range. There is a high concern for this species in California because it is restricted in distribution and known from few sites (USDA, USDI 2000a, p. 273).

Under Alternatives 1 and 3, *Lobaria oregana* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 274). Due to restricted distribution and extremely low numbers, there is a high risk of extirpation in northern California under Alternatives 1 and 3.

Under Alternative 2, *Lobaria oregana* is assumed to be included in the BLM Special Status Species program in California. It is not included in the Forest Service Sensitive Species program in California, where it is rare and present on National Forest System lands. This species would not maintain stable populations and/or distributions under Alternative 2 due to restricted distribution and extremely low numbers. There is a high risk of extirpation in northern California under Alternative 2.

Microcalicium arenarium

Microcalicium arenarium is known from one Washington site that is not on federally managed lands. There is still limited information on the distribution, ecology, and abundance of most pin lichens in the Northwest Forest Plan area (USDA, USDI Species Review Panel 1999 and 2000), and uncertainty regarding its association with late-successional or old-growth forests.

Under Alternatives 1 and 3, *Microcalicium arenarium* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 290). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Microcalicium arenarium* is assumed to be included in the Special Status Species program for the BLM in Oregon and Washington. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Nephroma bellum

Nephroma bellum has a broad global distribution and is well distributed west of the Cascade crest (USDA, USDI Species Review Panel 1999). Current information indicates that it may be common in the Northwest Forest Plan area, although it is rare in the parts of its range included in Survey and Manage (OR Klamath, OR Willamette Valley, OR Eastern Cascades, WA Eastern Cascades, WA Western Cascades (outside of the Gifford Pinchot National Forest), and WA Olympic Peninsula provinces). Many of the known sites in Oregon and Washington are protected by reserves (ISMS database). One site has been reported but has not been verified for California; this site does not occur on federally managed lands.

Under Alternatives 1 and 3, *Nephroma bellum* would receive management of known sites and strategic surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 309). Due to management of known sites, strategic surveys, protection by reserves, and species abundance in some Northwest Forest Plan areas, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Nephroma bellum* is assumed be included in the Agencies' Special Status Species Program for the Forest Service in Washington and the BLM in California. This species would maintain stable populations and/or distributions under Alternative 2 due to management of known sites, pre-project clearances, protection by reserves, and species abundance in some Northwest Forest Plan areas. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Nephroma isidiosum

Nephroma isidiosum occurs in southern British Columbia and in forested sites in Alaska, and is suspected to occur in the North Cascades. Because it is not yet known for the Northwest Forest Plan area, nothing is known of this species here and its status is undetermined. In addition, it is uncertain if this species is closely associated with late-successional or old-growth forests (USDA, USDI 2000a, p. 299).

Under Alternatives 1 and 3, *Nephroma isidiosum* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how distribution and stability would be affected (USDA, USDI 2000a, p. 301). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Nephroma isidiosum* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Nephroma occultum

Nephroma occultum is a western North American endemic occurring from British Columbia to southern Oregon (USDA, USDI 2000a). Almost all sites are on federally managed land; about 30 percent occur in reserve land allocations (USDA, USDI Species Review Panel 2000). It occurs on large, old, lateral limbs of conifers (USDA, USDI 2000a, p. 293).

Under Alternatives 1 and 3, *Nephroma occultum* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Late-successional, old-growth legacy components in younger stands provide important refugia and propagule sources to re-colonize younger stands. While surveys in these important legacy components would not be completed in younger stands, existing Northwest Forest Plan Standards and Guidelines for Matrix management provide for retention of these legacy components. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 295). Due to management of known sites, pre-disturbance surveys, strategic surveys, and protection by reserves, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Nephroma occultum* is assumed be included in the Sensitive Species program for the Forest Service in Washington. There is a high risk of loss of sites on National Forest System and BLM lands in Oregon where it is not protected by reserves. Loss of these sites could result in a high risk of extirpation in this portion of its range. However, this species would maintain stable populations and/or distribution range-wide in the Northwest Forest Plan area under Alternative 2 due to protection of sites by reserves, Northwest Forest Plan Standards and Guidelines, management of known sites, and pre-project clearances. There is not a high risk of extirpation range-wide in the Northwest Forest Plan area under Alternative 2.

Niebla cephalota

Niebla cephalota occurs from Baja California to Washington in coastal fog belt areas (McCune et al. 1997). This lichen is still considered rare in the Northwest Forest Plan area, and has a low number of known sites, low number of individuals at each site, limited distribution, and narrow ecological amplitude (USDA, USDI 2000a, p. 285).

Under Alternatives 1 and 3, *Niebla cephalota* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 286). Due to low number of known sites, low number of individuals at each site, limited distribution, and narrow ecological amplitude, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Niebla cephalota* is assumed be included in the Agencies' Special Status Species Programs, except for the Forest Service in California where there is little suitable habitat. This species would not maintain stable populations and/or distributions under Alternative 2 due to low number of known sites, low number of individuals at each site, limited distribution, and narrow ecological amplitude. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Pannaria rubiginosa

Pannaria rubiginosa has a broad global distribution, but is considered rare in the Northwest Forest Plan area. This is a coastal lichen. There is high concern for this species due to low numbers of known sites, low number of individuals, limited distribution, and narrow ecological amplitudes (USDA et al. 1993; USDA, USDI 1994b, Appendix J2; USDA, USDI 2000a; and USDA, USDI Species Review Panel 1999).

Under Alternatives 1 and 3, *Pannaria rubiginosa* would receive management of known sites and strategic surveys. With a high degree of uncertainty, due to low numbers of known sites, low number of individuals, limited distribution, and narrow ecological amplitudes, this species would maintain stable populations and/or distribution (USDA, USDI 2000a, p. 307). Due to management of known sites and strategic surveys, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Pannaria rubiginosa* is assumed to be included in the Agencies' Special Status Species Programs except for the Forest Service in California. There is little suitable habitat on National Forest System lands in California. Due to management of known sites and pre-project clearances, this species would maintain stable populations and/or distribution. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Peltigera pacifica

Peltigera pacifica occurs in Washington and Oregon and is a Pacific Northwest endemic. It occurs primarily in riparian forests and hardwood stands, but also in moist forests at low to mid-elevation (McCune and Geiser 1997), and in a range of stand ages (USDA, USDI Species Review Panel 1999). This species is widespread in the Northwest Forest Plan area west of the Cascade crest (McCune and Geiser 1997 and USDA, USDI Species Review Panel 1999 and 2000). A portion of its population may be provided for by the reserve land allocation, particularly the riparian buffers under the Aquatic Conservation Strategy. The contribution of the Riparian Reserves and other reserve allocations to provide for stable populations of this species is unknown (USDA, USDI 2000a, p. 304).

Under Alternatives 1 and 3, *Peltigera pacifica* would receive management of known sites and strategic surveys. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 305). Due to protection by reserves, management of known sites, and strategic surveys, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Peltigera pacifica* is assumed be included in the Sensitive Species program for the Forest Service in Oregon and Washington. It is assumed not to be included in the Special Status Species programs for the BLM in Oregon and Washington. There is a high risk of loss of sites on BLM managed lands in Oregon and Washington where not protected by reserves. Loss of these sites could result in a high risk of extirpation in this portion of its range. Due to protection by reserves, management of known sites, and pre-project clearances, this species would maintain stable populations and/or distributions under Alternative 2. There is not a high risk of extirpation range-wide for the Northwest Forest Plan area under Alternative 2.

Platismatia lacunosa

Platismatia lacunosa occurs in Washington and Oregon. It is common in the Oregon Coast Range and rare in the rest of its range. A high proportion of known sites, most of which are in the Oregon Coast Range, are protected by reserve land allocations (ISMS database). It is sometimes, but not necessarily, associated with riparian areas where it often grows on alders. This species occurs primarily at lower elevations and it is unknown at this time how much potential habitat exists on federally managed lands (USDA, USDI 2000a, p. 299). Although riparian enhancement projects that remove hardwoods within Riparian Reserves can disturb habitat for this species, the

Aquatic Conservation Strategy would lower the risk of loss of sites. Other reserve allocations may also provide some protection of known sites (USDA, USDI 2000a, p. 299).

Under Alternatives 1 and 3, *Platismatia lacunosa* would be included in the Survey and Manage Standards and Guidelines except in the Oregon Coast Range. Known sites would be managed and strategic surveys would be completed. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 299). Due to management of known sites, strategic surveys, protection of sites by reserves, and species abundance in the Oregon Coast Range, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Platismatia lacunosa* is assumed be included in the Forest Service Sensitive Species program in Washington. Due to species abundance in the Oregon Coast Range, protection of sites by reserves, management of known sites, and pre-project clearances under the Forest Service Sensitive Species Program in Washington, this species would maintain stable populations and/or distributions under Alternative 2. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Pseudocyphellaria perpetua

Pseudocyphellaria perpetua is known from only a few sites in the Northwest Forest Plan area, all in Oregon. There is one known site on National Forest System lands on the Willamette National Forest (McCune 2003, pers. comm.) and five sites on BLM managed lands (Rodenkirk 2003, pers. comm.). The sites on federally managed lands are located in old-growth stands. *Pseudocyphellaria perpetua* is the new name for this species (Miadlikowska et al. 2002). FEMAT (1993) and the Northwest Forest Plan Final SEIS (1994) erroneously applied the name *Pseudocyphellaria mougeotiana*. Because of the erroneous name, the Survey and Manage Final SEIS (2000) and Lichen Management Recommendations (USDA, USDI 2000c) identified this entity as *Pseudocyphellaria* sp. #1 while acknowledging the taxonomic work that was underway. The taxonomic uncertainty was resolved when the new name was published in 2002.

Under Alternatives 1 and 3, *Pseudocyphellaria perpetua* would receive management of known sites and strategic surveys. There is insufficient information to determine how the distribution and stability of this species would be affected (USDA, USDI 2000a, p. 282). There is insufficient information about this species to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Pseudocyphellaria perpetua* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information to determine how the alternative would affect distribution and stability of this species. There is insufficient information about the species to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Pseudocyphellaria rainierensis

Pseudocyphellaria rainierensis is a Pacific Northwest endemic. It is known to occur from southeastern Alaska to southern Oregon, west of the Cascade Crest (USDA, USDI Species Review Panel 2000). It is rare in Washington but is more common on the Willamette National Forest in Oregon. It reaches the southern edge of its range in southern Oregon. This species occurs primarily in the oldest stands on the landscape and is rarely found in stands less than 400 years old (USDA, USDI 2000a and Mt. Baker-Snoqualmie NF Ecology Program data files).

Under Alternatives 1 and 3, *Pseudocyphellaria rainierensis* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Late-successional, old-growth legacy components in younger stands provide important refugia and propagule sources to re-colonize younger stands. While surveys in these important legacy components would not be completed in younger stands for this species, existing Northwest

Forest Plan Standards and Guidelines for Matrix management provide for retention of these legacy components. This species would maintain stable populations and/or distributions (USDA, USDI 2000a, p. 282). Due to management of known sites, pre-disturbance surveys, strategic surveys, Northwest Forest Plan Standards and Guidelines for retaining legacy components in the Matrix, and species abundance on the Willamette National Forest, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Pseudocyphellaria rainierensis* is assumed not to be included in the Agencies' Special Status Species Programs. There is a high risk of loss of sites at the southern limit of its range (south of the Willamette National Forest) in Oregon where not protected by reserves. Loss of these sites could affect stability and distribution of populations and result in a high risk of extirpation in the southern end of its range. Due to species abundance on the Willamette National Forest and Northwest Forest Plan Standards and Guidelines for retaining late-successional, old-growth legacy components, this species would maintain stable populations and/or distributions range-wide under Alternative 2. There is not a high risk of extirpation range-wide in the Northwest Forest Plan area under Alternative 2.

Ramalina thrausta

Ramalina thrausta occurs in boreal North America. It has been reported to occur south into northern California, and in western Montana (McCune and Geiser 1997). To date, many locations for this species have been reported from mature or old-growth forests (USDA, USDI Species Review Panel 1999). It can occur on alders in riparian areas. Although riparian enhancement projects that remove hardwoods within Riparian Reserves can disturb habitat for this species, the Aquatic Conservation Strategy would lower the risk of loss of these sites. The number of known sites on federally managed land is still low (USDA, USDI 2000a, p. 283) and many known sites are not protected by reserve land allocations.

Under Alternatives 1 and 3, *Ramalina thrausta* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Late-successional, old-growth legacy components in younger stands provide important refugia and propagule sources to re-colonize younger stands. While surveys in these important legacy components would not be completed in younger stands for this species, existing Northwest Forest Plan Standards and Guidelines for Matrix management provide for retention of these legacy components. This species would stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 284). Due to management of known sites, pre-disturbance surveys, strategic surveys, and Northwest Forest Plan Standards and Guidelines for retaining legacy components in the Matrix, there is not a risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Ramalina thrausta* is assumed to be included in the Sensitive Species Programs for the Forest Service in Washington and California. It is assumed not to be included in the Special Status Species Programs for the Forest Service in Oregon or the BLM in Oregon, Washington, or California. Due to small number of known sites and lack of protection through reserves or the Agencies' Special Status Species Programs, there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Stenocybe clavata

Stenocybe clavata is a Pacific Northwest endemic where its distribution is unknown. It is still poorly known in the Northwest Forest Plan area (USDA, USDI 2000a, p. 301). Habitat data is limited and it is uncertain if it is closely associated with late-successional or old-growth forests (USDA, USDI 2000a, p. 301).

Under Alternatives 1 and 3, *Stenocybe clavata* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine how

distribution and stability would be affected (USDA, USDI 2000a, p. 303). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 1 or 3.

Under Alternative 2, *Stenocybe clavata* is assumed not to be included in the Agencies' Special Status Species Programs. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Teloschistes flavicans

Teloschistes flavicans is still considered rare in the Northwest Forest Plan area where there are a low number of known sites, low number of individuals, limited distribution, and narrow ecological amplitude (USDA, USDI 2000a, p. 285).

Under Alternatives 1 and 3, *Teloschistes flavicans* would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p.286). Due to low number of known sites, low number of individuals, limited distribution, and narrow ecological amplitude, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Teloschistes flavicans* is assumed be included in the Agencies' Special Status Species Programs for the Forest Service in Oregon and the BLM in Oregon, Washington, and California. This species would not maintain stable populations and/or distributions under Alternative 2 due to low number of known sites, low number of individuals, limited distribution, and narrow ecological amplitude. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Tholurna dissimilis

Tholurna dissimilis is rare in Oregon where there are few known sites. It occurs on sub-alpine and alpine conifers. Potential habitat is limited in extent in this part of its range (USDA, USDI 2000a, p. 276).

Under Alternatives 1 and 3, *Tholurna dissimilis* would receive management of known sites and strategic surveys. There is insufficient information about this species to determine if distribution and stability would be affected (USDA, USDI 2000a, p. 276). There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Tholurna dissimilis* is assumed to be included in the Special Status Species Programs for the BLM and the Forest Service in Washington and Oregon. There is insufficient information about this species to determine how the alternative would affect distribution and stability. There is insufficient information to determine if there is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Usnea hesperina

For *Usnea hesperina*, current information indicates this lichen is still rare in the Northwest Forest Plan area, with low number of known sites, low numbers of individuals, limited distribution, and narrow ecological amplitude (USDA, USDI 2000a, p. 290).

Under Alternatives 1 and 3, *Usnea hesperina* would receive management of known sites and strategic surveys. This species would not maintain stable populations and/or distributions (USDA, USDI 2000a, p. 293). Due to low numbers of known sites, low number of individuals, limited

distribution, and narrow ecological amplitudes, there is a high risk of extirpation in the Northwest Forest Plan area under Alternatives 1 and 3.

Under Alternative 2, *Usnea hesperina* is assumed not to be included in the Agencies' Special Status Species Programs. This species would not maintain stable populations and/or distributions under Alternative 2 due to low numbers of known sites, low number of individuals, limited distribution, and narrow ecological amplitudes. There is a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Usnea longissima

Usnea longissima in Oregon (except in Curry, Josephine, and Jackson Counties and in Washington) is uncommon. It can be locally abundant in all of its range. Although this species was once thought to be riparian, it is now known to occur on ridge tops (Keon and Muir 2002) and at other non-riparian sites. In California and in Oregon's Curry, Josephine, and Jackson Counties it is rare and is apparently old-growth associated.

Under Alternative 1, *Usnea longissima* would receive pre-disturbance surveys, management of known sites, and strategic surveys in California and in Oregon's Curry, Josephine, and Jackson Counties. This species would receive only strategic surveys in Oregon outside of Curry, Josephine, and Jackson Counties. This species would maintain stable populations and/or distributions under Alternative 1 (USDA, USDI 2000a, p. 278). Due to pre-disturbance surveys, management of known sites, and strategic surveys, there is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 1.

Under Alternative 2, *Usnea longissima* is assumed be included in the Agencies' Special Status Species Programs throughout its range except for the BLM in Oregon and Washington. Due to management of known sites and pre-project clearances, this species would maintain stable populations and/or distributions under Alternative 2. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 2.

Under Alternative 3, this species would receive pre-disturbance surveys, management of known sites, and strategic surveys in California and in Oregon's Curry, Josephine, and Jackson Counties. Management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Outside of California and Oregon's Curry, Josephine, and Jackson Counties, this species would be included in the Agencies' Special Status Species Programs except for the BLM in Oregon and Washington. Due to pre-disturbance surveys, pre-project clearances, management of known sites, and strategic surveys, this species would maintain stable populations and/or distributions under Alternative 3. There is not a high risk of extirpation in the Northwest Forest Plan area under Alternative 3.

Summary and Possible Mitigation

Under all alternatives, 14 of 43 lichen species would be at high risk for extirpation in the Northwest Forest Plan area. The high risk of extirpation is not a result of federal actions.

Under all alternatives, 15 of 43 lichen species would not be at high risk for extirpation in the Northwest Forest Plan area.

Under all alternatives, 13 of 43 lichen species have insufficient information to draw a conclusion regarding a high risk of extirpation in the Northwest Forest Plan area.

Under Alternatives 1 and 3, one lichen species (*Ramalina thrausta*) would not be at high risk for extirpation in the Northwest Forest Plan area. Under Alternative 2, *Ramalina thrausta* would be at high risk of extirpation in the Northwest Forest Plan area. Mitigation of these effects under Alternative 2 could include management of known sites not protected by reserves or the Agencies'

Special Status Species Programs. Mitigation could also include pre-project clearances. These mitigations would eliminate the high risk of extirpation for this species. These mitigations would be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

Additionally, for four species (*Dendriscocaulon intricatulum, Nephroma occultum, Peltigera pacifica,* and *Pseudocyphellaria rainierensis*) under Alternative 2, while they are not at high risk range-wide in the Northwest Forest Plan area, they are at high risk in portions of their ranges. Mitigation of these effects under Alternative 2 could include management of known sites not protected by reserves or the Agencies' Special Status Species programs. In addition, for *Dendriscocaulon intricatulum*, *Nephroma occultum*, and *Pseudocyphellaria rainierensis* mitigation could also include pre-project clearances. These mitigations would eliminate the high risk of extirpation for these species in portions of their ranges. These mitigations would be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

Vascular Plants

Background and Affected Environment

Vascular plants create the structure of the forest and function as the primary producers, capturing sunlight through photosynthesis and converting their energy to foods consumed by animals and fungi. They include seed-bearing plants (flowering plants and conifers) and spore-bearing forms such as ferns, horsetails, and club mosses. Ranging from dominant conifers to the delicate fern, vascular plants are defined as those that contain conducting or vascular tissue (USDA et al. 1993, p. IV-111).

In general, vascular plants provide substrate and habitat for other organisms, influence microclimate, and provide forage, hiding, and thermal cover for vertebrate and invertebrate species. They produce litter fall that contributes to organic matter and soil development (USDA et al. 1993, p. IV-111).

The habitat components important to vascular plants are those that generally increase amounts of late-successional, riparian, and old-growth habitat. Alternative 9 of the Northwest Forest Plan Final SEIS provides intermediate levels of these habitat conditions (USDI, USDA 1994a, p. S-18).

Elements of the Northwest Forest Plan that are important to vascular plants include the system of reserves, introduction of prescribed fire, and retention of late-successional, old-growth, and riparian habitat components in the Matrix (retaining coarse woody debris, green trees, snags, and old-growth remnants where little remains) (USDA, USDI 1994a).

Field surveys, research, and monitoring have provided additional information on the abundance, distribution, and range for most of these species (USDA, USDI Species Review Panel 1999).

Environmental Consequences

Under Alternative 1, there would be 12 vascular plants included under the Survey and Manage Standards and Guidelines (see Table 2-8).

Under Alternative 2, 10 species are assumed to be included in the Agencies' Special Status Species Programs (see Table 2-8).

Under Alternative 3, there would be eight species included under the Survey and Manage Standards and Guidelines in Category A. Management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys for these eight species. Late-successional and old-growth legacy components in younger stands provide important refugia and propagule sources to re-colonize younger stands. While surveys in these important legacy components would not be completed in younger stands for these eight species, existing Northwest Forest Plan Standards and Guidelines for Matrix management (USDA, USDI 1994b, pp. C-39 through C-48) provide for retention of these legacy components. Under Alternative 3, two species would also be included in the Agencies' Special Status Species Programs (see Table 2-8).

Under all alternatives, vascular plants would receive protection under the network of reserves. The Northwest Forest Plan Final SEIS concluded that several alternatives, including Alternative 9, provided an intermediate level of habitat conditions important to vascular plants (USDA, USDI 1994a, p. 3&4-155).

Arceuthobium tsugense ssp. *Mertensianae*

A majority of sites occur in reserve land allocations (USDA, USDI 2000a, p. 318). Additionally, retention of old-growth fragments in the Matrix where little exists provides benefit to this species (USDA, USDI 1994a, p. 3&4-156).

Under Alternative 1, this species would be included in Category F, which requires strategic surveys. Since a majority of known sites would be protected under reserve land allocations, Alternative 1 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 318). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 1.

Under Alternatives 2 and 3, this species is assumed not to be included in the Agencies' Special Status Species Programs. Since a majority of known sites would be protected under reserve land allocations, Alternatives 2 and 3 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 2 and 3.

Bensoniella oregana

This species has a restricted range and small populations in California. It is more common in Oregon. It does not occur in Washington. Cumulative effects of actions on nonfederal lands are impacting this species. Harvest, grazing, fire suppression, and road construction have negatively affected it. This species has potential habitat in reserve land allocations (USDA, USDI 2000a, p. 317).

Under Alternatives 1 and 3, this species would be included in Survey and Manage as a Category A species in the California portion of its range. It would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. The management efforts identified for this species would provide sufficient habitat (including known sites) to allow it to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 317). Due to management of known sites, pre-disturbance surveys, strategic surveys, and potential habitat in reserve land allocations, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species is assumed to be included in the Special Status Species Programs for the Forest Service in Oregon and California and for the BLM in Oregon. Since habitat is known to occur in reserve land allocations and this species is included in the Agencies' Special Status Species Programs where known sites are managed and pre-project clearances are completed, Alternative 2 would provide sufficient habitat to allow the species to stabilize in a

pattern similar to its reference distribution. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Botrychium minganense and *Botrychium montanum*

Botrychium minganense is one of the most widespread moonworts in North America. In the Northwest Forest Plan area, it is known from Washington, Oregon, and California. This species no longer meets the basic criteria for Survey and Manage in Washington because of the number of sites found in reserve land allocations (USDA, USDI 1998 and USDA, USDI Species Review Panel 1999). *Botrychium montanum* is found in western North America. Most of the known occurrences have been reported from Oregon, Montana, and Washington.

Under Alternatives 1 and 3, these species would be included in Category A, which requires management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys; however, potential habitat is known to occur in reserve land allocations that would not be typically subject to pre-disturbance surveys (USDA, USDI 2000a, p. 317). Management efforts would provide sufficient habitat to allow these species to stabilize in a pattern similar to reference distribution (USDA, USDI 2000a, p. 317). There would not be a high risk of extirpation in the Northwest Forest Plan area for these species under Alternatives 1 and 3.

Under Alternative 2, *Botrychium minganense* would be included in the Sensitive Species program for the Forest Service in Oregon and California. *Botrychium montanum* would be included in the Special Status Species programs for the Forest Service in Oregon and California and the BLM in Oregon and Washington. Since habitat is known to occur in reserve land allocations and these species are included in the Agencies' Special Status Species Programs where they receive management of known sites and pre-project clearances, Alternative 2 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation in the Northwest Forest Plan area for these species under Alternative 2.

Coptis asplenifolia and *Coptis trifolia*

Coptis asplenifolia reaches the southern extant of its range in northern Washington west of the Cascades. *Coptis trifolia* occurs from Greenland across North America to Alaska. It also occurs in northeast Asia to northern Japan. There are two disjunct populations in the western United States, in Washington and Oregon.

Under Alternatives 1 and 3, these species would be included in Category A, which requires management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys; however, these species are known to have potential habitat in reserve land allocations that would not typically be subject to pre-disturbance surveys (USDA, USDI 1998 and USDA, USDI Species Review Panel 1999). Management of known sites, pre-disturbance surveys, strategic surveys, and reserves would provide sufficient habitat to allow these species to stabilize in a pattern similar to reference distribution under Alternative 1 (USDA, USDI 2000a, p. 317). There would not be a high risk of extirpation in the Northwest Forest Plan area for these species under Alternatives 1 and 3.

Under Alternative 2, *Coptis asplenifolia* would be included in the Sensitive Species program for the Forest Service in Washington. *Coptis trifolia* would be included in the Special Status Species Programs for the Forest Service in Washington and the BLM in Oregon. Since habitat is known to occur in reserve land allocations and these species are included in the Agencies' Special Status Species Programs where they receive management of known sites and pre-project clearances, Alternative 2 would provide sufficient habitat to allow the species to stabilize in a pattern similar to reference distributions. There would not be a high risk of extirpation in the Northwest Forest Plan area for these species under Alternative 2.

Corydalis aquae-gelidae

This species is restricted to the western Cascades of Skamania and Clark Counties in, Washington and Clackamas, Lane, Linn, Marion, and Multnomah Counties in Oregon. Almost all known occurrences are within National Forest System lands and within riparian buffers.

Under Alternatives 1 and 3, this species would be included in Category A, which requires management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Due to management of known sites, pre-disturbance surveys, strategic surveys, and the location of most known sites in Riparian Reserves, Alternatives 1 and 3 would provide sufficient habitat to allow this species to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 318). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species would be included in the Special Status Species programs for the Forest Service and BLM in Oregon and Washington. Since habitat is known to occur in Riparian Reserve allocations and this species is included in the Agencies' Special Status Species Programs where they receive management of known sites and pre-project clearances, Alternative 2 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Cypripedium fasciculatum

This species is known from Washington, Oregon, and California. This species has small and scattered populations that are declining. Cumulative effects of fragmentation, loss of habitat on private land, and lack of fire have reduced habitat. In the eastside of the Cascades in Washington, the species is not associated with old-growth forest (USDA, USDI 2003a).

Under Alternative 1, this species would receive management of high-priority sites, pre-disturbance surveys, and strategic surveys except in the Washington Eastern Cascades. Applying the Survey and Manage Standards and Guidelines to the entire range of the species within the Northwest Forest Plan area would improve the chances for *Cypripedium fasciculatum* to stabilize in a pattern similar to reference distribution (USDA, USDI 2000a, p. 319). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 1.

Under Alternatives 2 and 3, *Cypripedium fasciculatum* is assumed to be included in the Special Status Species programs for the BLM and Forest Service in Washington, Oregon, and California. Since this species is included in the Agencies' Special Status Species Programs where they receive management of known sites and pre-project clearances, Alternatives 2 and 3 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation for this species in the Northwest Forest Plan area under Alternatives 2 and 3.

Cypripedium montanum

This species is known from Washington, Oregon, and California. It has small and scattered populations that are declining. Cumulative effects of fragmentation, loss of habitat on private land, and lack of fire have reduced habitat.

Under Alternative 1, this species would receive management of high-priority sites, pre-disturbance surveys, and strategic surveys. Applying the Survey and Manage Standards and Guidelines to the entire range of *Cypripedium montanum* within the Northwest Forest Plan area would improve the chances for it to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 319). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 1.

Under Alternatives 2 and 3, *Cypripedium montanum* is assumed to be included in the Special Status Species program for the BLM and the Forest Service in California. It is assumed not to be included in the Special Status Species programs for the BLM or Forest Service in Washington and Oregon. This could lead to loss of populations on federally managed lands in Washington and Oregon. This species is abundant in Washington, so the loss of populations is most important in Oregon. There is a high risk of extirpation for *Cypripedium montanum* on Forest Service and BLM managed lands in Oregon where known sites are not protected by reserves. Since this species is included in the Agencies' Special Status Species Programs in California where it receives management of known sites and pre-project clearances and it is abundant in Washington, Alternatives 2 and 3 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation for this species range-wide in the Northwest Forest Plan area under Alternatives 2 and 3.

Eucephalus vialis

This species is known from Oregon and California. There is currently a single known site in California which is protected on National Forest System lands. This species has potential habitat in reserve land allocations (USDA, USDI 2000a, p. 317).

Under Alternatives 1 and 3, this species would receive management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Management identified would allow *Eucephalus vialis* to stabilize in a pattern different from its reference distribution (USDA, USDI 2000a, p. 317). Due to management of known sites, pre-disturbance surveys, strategic surveys, and potential habitat in reserve land allocations, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, *Eucephalus vialis* is assumed to be included in the Special Status Species programs for the BLM and the Forest Service in Oregon. Management efforts under Alternative 2 would allow *Eucephalus vialis* to stabilize in a pattern different from its reference distribution. Due to management of known sites, pre-project clearances, and potential habitat in reserve land allocations, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Galium kamtschaticum

The current known range of this species within the Northwest Forest Plan area is limited to the Olympic and Cascades Mountains north of Snoqualmie Pass in the State of Washington (USDA, USDI 2000a, p. 317). It is not a concern in the WA Western Cascades Physiographic Province of the Mt. Baker-Snoqualmie National Forest because a high number of healthy populations occur in reserves spanning an array of geographic locations and habitats (USDA, USDI 1998 and USDA, USDI Species Review Panel 1999).

Under Alternatives 1 and 3, this species would be included in Category A, which requires management of known sites, pre-disturbance surveys, and strategic surveys. Under Alternative 3, management activities in non-late-successional and non-old-growth forest stands would be exempt from pre-disturbance surveys. Management efforts would provide sufficient habitat to allow this species to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 317). Due to Survey and Manage mitigation and potential habitat in reserve land allocations, there would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 1 and 3.

Under Alternative 2, this species would be included in the Sensitive Species program for the Forest Service in Washington. Due to management of known sites, pre-project clearances and

potential habitat in reserve land allocations, Alternative 2 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 2.

Platanthera orbiculata var. *orbiculata*

This species occurs throughout Canada, south to South Carolina and Tennessee in the east and Oregon to Wyoming in the west. There is a moderate to high likelihood of sites occurring in reserves (USDA, USDI 1998 and USDA, USDI Species Review Panel 1999). Additionally, retention of old-growth fragments in the Matrix where little exists provides benefit to this species (USDA, USDI 1994a, p. 3&4-156).

Under Alternative 1, this species would be included in Category C, which requires management of high-priority sites, pre-disturbance surveys, and strategic surveys. Survey and Manage mitigation under Alternative 1 would provide sufficient habitat to allow this species to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 318). There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternative 1.

Under Alternatives 2 and 3, *Platanthera orbiculata* var. *orbiculata* would not be included in the Agencies' Special Status Species Programs. Since habitat is known to occur in reserve land allocations, Alternatives 2 and 3 would provide sufficient habitat to allow the species to stabilize in a pattern similar to its reference distribution. There would not be a high risk of extirpation in the Northwest Forest Plan area for this species under Alternatives 2 and 3.

Summary and Possible Mitigation

Under all alternatives there would not be a high risk of extirpation in the Northwest Forest Plan area for these 12 species.

However, for one species (*Cypripedium montanum*), while it is not at high risk range-wide in the Northwest Forest Plan area under Alternatives 2 and 3, it is at high risk in a portion of its range (Washington and Oregon). Mitigation of these effects under Alternatives 2 and 3 could include management of known sites not protected by reserves or the Agencies' Special Status Species Programs. In addition mitigation could include pre-project clearances. These mitigations would eliminate the high risk of extirpation for this species in a portion of its range. These mitigations would be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

Arthropods

Background and Affected Environment

Arthropods, invertebrates with jointed legs, a segmented body, and an exoskeleton, constitute more than 85 percent of the biodiversity in late-successional forests (Asquith et al. 1990) and play a vital role in ecosystem processes (Wilson 1987). They include insects, mites, crustaceans, spiders, and myriapods. Four guilds (groups of species) of arthropods (out of 15 functional groups) were included in the Survey and Manage Standards and Guidelines because there was not sufficient information to determine necessary levels of management for them. They are: (1) litter and soil dwellers; (2) coarse woody debris chewers; (3) understory and forest gap herbivores; and, (4) canopy herbivores. Some species of arthropods are included in the Agencies' Special Status Species Programs. For example, the Mardon Skipper Butterfly is listed as Sensitive by the Forest Service in Region 6.

Arthropods inhabit virtually every part of the coniferous forest ecosystem, including coarse woody debris, litter and soil layers, understory vegetation, canopy foliage, tree trunks, snags, and the aquatic system. The litter and soil of the forest floor is the site of some of the greatest biological diversity found anywhere (USDA et al. 1993, p. IV-137). The structure and function of temperate forest soils are largely determined by the feeding habits of soil arthropods. They are the basic consumers of the forest floor where they ingest and process massive quantities of organic litter and debris, from large logs to bits of moss (Lattin and Moldenke 1992). While the richness of arthropod species in late-successional and old-growth forests suggests a great number of different processes and functions, relatively little is known about how arthropods interact, survive, and contribute to ecosystem function (USDA et al. 1993, p. IV-137). It has been estimated that there are between 20,000 and 25,000 described species of arthropods within the Northwest Forest Plan area, and as many or more not yet described (USDA, USDI 2000a).

For Alternative 9 of the Northwest Forest Plan Final SEIS, ratings for these four arthropod guilds showed an 80 percent or greater likelihood of achieving outcomes A and/or B: providing habitat of sufficient quality, distribution, and abundance to support stable populations either well distributed when measured against their historic range or distributed with gaps in their historic distribution on federally managed lands. Risk of extirpation varied between 2 and 6 percent for the four guilds (USDA, USDI 1994a, p. 3&4-161). The four guilds were divided into northern and southern ranges. Only the southern portions of their ranges were subject to additional analysis for inclusion in Survey and Manage (USDA, USDI 199a, pp. 3&4 -160).

There is concern regarding the persistence of arthropods for several reasons. First, many of the species are flightless, so their dispersal capabilities are limited. Second, their flightless condition is believed to reflect habitat stability and permanence; therefore, they are sensitive to habitat disturbance. Third, many of the old-growth forest associated species have disjunct distributions and are endemic to undisturbed conifer forests of the Pacific Northwest. Fourth, arthropods are key to ecosystem function and may serve as indicators of ecosystem health. Last, many of the species native to this region have not been described or named and the number of known species probably represents less than half of the number of species estimated to exist (Lattin and Moldenke 1992). In a recent survey, 10 percent of the beetle species found was new to science (O'Keefe and Rappaport, unpublished).

New research has shown that fire can reduce soil arthropod biodiversity (particularly the two forest floor arthropods guilds: soil/litter dwellers and coarse woody debris chewers) more than expected (Rappaport et al. in press and Camann et al. in press). In these two studies in the southern Cascade Range, soil arthropod species richness and diversity continued to decline for 2 years following fire, but late-successional stand characteristics mitigated the negative effects of fire. Even 2 years after the fire, there was no consistent sign of recovery of soil arthropods. This new information raises questions about the persistence of soil arthropods when subjected to fire, particularly high-intensity wildfire. Management that reduces fuel loads to minimize high-intensity wildfires will likely increase the probability of persistence of soil arthropods.

Environmental Consequences

Under Alternative 1, the four arthropod guilds would be included in the Survey and Manage Standards and Guidelines in Category F which requires strategic surveys. Under Alternatives 2 and 3, the four arthropod guilds are assumed not to be included in the Agencies' Special Status Species Programs; however, individual arthropods, like species in any other taxonomic grouping, might qualify for the Special Status Species Programs. Under Alternatives 2 and 3, strategic surveys for arthropods would no longer be conducted.

New information gathered since 1994 does not substantially alter the basic assumptions or conclusions of the Northwest Forest Plan Final SEIS that expressed a concern that their ecological

functions may not persist in the south range. However, there continues to be insufficient information upon which to determine an outcome for these four guilds (USDA, USDI 2000a, p. 321).

In summary, new information gathered since 1994 increases concern about the effect of fire on two arthropod guilds (soil/litter dwellers and coarse woody debris chewers). However, there is insufficient information to determine an outcome in the Northwest Forest Plan area for the four arthropod guilds under Alternatives 1, 2 and 3.

The determination of whether a species is at high risk of extirpation in the Northwest Forest Plan area which was made for other taxa in this analysis, is not made because it is not practical to make those determinations for entire guilds which consist of thousands of individual species.

Mollusks

Background and Affected Environment

Mollusk species that inhabit Northwest forests include land snails, slugs, aquatic snails, and bivalves. Many mollusks have restricted geographic ranges and narrow ecological requirements. All 39 of the mollusk species below are either endemic to the Northwest Forest Plan area or have ranges that lie mostly within the Northwest Forest Plan area.

Several different factors contribute to rarity and concerns for persistence in these animals. Some of the species are confined to very narrow ranges in which subpopulations appear relatively well-connected demographically and genetically. However, the likelihood of range-wide species extirpation is a serious concern due to habitat alteration or catastrophic events. Other species are found widely scattered over a large range, so the likelihood of range-wide species extirpation is low, but likelihood of loss of some populations, connectivity among populations, and normal biological function is high.

Several factors make prediction of occupation rates of suitable habitat difficult. While the understanding of suitable habitat has improved since 1994, habitat definitions remain general. Habitat suitability for many species appears to depend on microsite conditions that are difficult or impossible to map. Because of the extremely limited dispersal ability of these animals and their sensitivity to environmental conditions like temperature and humidity, recolonization of unoccupied habitat is extremely slow, and historical factors leave their signature in current distributions. Suitable habitat may remain unoccupied for indefinite periods of time. As a result, the analysis of occupation of different land allocations, association with habitat types, and extent or pattern of distribution relies on data from known sites more than on predictive approaches.

Under Alternative 1, there are 39 mollusk species included in the Survey and Manage Standards and Guidelines (see Table 2-8). Under Alternative 2, there are 25 mollusk species included in the Agencies' Special Status Species Programs (see Table 2-8). Under Alternative 3, there are 37 species included in the Survey and Manage Standards and Guidelines (Categories A, B, and E). Three uncommon species that are not included in the Survey and Manage Standards and Guidelines would be included in the Agencies' Special Status Species Programs.

Additional information regarding the background and affected environment for mollusks is found in the Survey and Manage Final SEIS 2000, the Northwest Forest Plan Final SEIS, and the FEMAT Report.

Environmental Consequences

Under Alternative 1, the outcome for 39 mollusk species was habitat sufficient to allow the species to stabilize in a pattern either similar to reference distribution (10 species) or altered from reference distribution with some limitations on biological function and species interactions (USDA, USDI 2000a, pp. 173 and 191, and USDA, USDI 2001, p. 14). *Monadenia infumata ochromphalus* was considered in 1994, 2000, and 2001 as two distinct taxa, *Monadenia fidelis klamathica* and *Monadenia fidelis ochromphalus*. These two taxa had nearly identical outcomes in those analyses, so the summaries of past analyses given below list them as a single species. Table 2-8 (at the end of Chapter 2) displays the category assignments for each of the 39 mollusk species analyzed here.

Analyses relevant to Alternative 2 include the FEMAT report which judged Option 9 and the Northwest Forest Plan Final SEIS which judged Alternative 9 among the alternatives that were generally the most favorable to mollusks (USDA, USDI 1994a, p. 3&4-165). However, the options in FEMAT and alternatives in the Northwest Forest Plan Final SEIS were less effective in providing for mollusks than any of the other species groups (USDA et al. 1993, p. IV-132). Of 102 species assessed, 97 species were rated low enough that they failed to pass the screen in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a, Appendix J2) and required additional analysis. All 39 species analyzed in this SEIS had combined likelihood scores in Outcomes C and D greater than 20. All but one species had at least some likelihood of Outcome D (USDA, USDI 1994a, Appendix J2). Rarity, localized distribution, habitat specialization, and lack of information played an important role in the FEMAT rating for most of these species. Those species currently confined to refugia because of habitat history and species life history were judged unlikely to expand their range and were rated accordingly. "Therefore, in even the most favorable situations such species were judged unlikely to be well distributed" (USDA et al. 1993, p. IV-135).

In the Northwest Forest Plan Final SEIS, 35 of the 39 mollusks species analyzed here were judged to be strongly or partly associated with riparian areas, or to have all or most sites in Late-Successional Reserves, Administratively Withdrawn Areas, or Congressionally Reserved Areas (USDA, USDI 1994a, Appendix J2). Data collected since the Northwest Forest Plan Final SEIS provides substantial new information on the association of these species with riparian areas and other reserves. All but one species (*Fluminicola* n. sp. 11, known from two sites) currently have a majority of their known sites outside of Late-Successional Reserves, Administratively Withdrawn Areas, or Congressionally Reserved Areas (ISMS database August 2002). However, these known site records do not represent a statistical sample of all land allocations. Of the 23 terrestrial species, 7 (*Cryptomastix hendersoni, Deroceras hesperium, Monadenia fidelis minor, Pristiloma arcticum crateris, Vertigo* n. sp. 1*, Vespericola pressleyi,* and *Vespericola shasta*) are currently believed to be associated with riparian areas in at least part of their range (USDA, USDI 2003b). The other 16 terrestrial species are not considered to be associated with riparian areas. The remaining 16 species are aquatic snails. The analysis completed in 2000 and the 2001 Annual Species Review considered the protection provided by the reserve network, including the Aquatic Conservation Strategy, to all of these species. These reviews determined that for 36 species plus a portion of the range of another species (*Megomphix hemphilli*), "The reserve system and other Standards and Guidelines of the Northwest Forest Plan do not appear to provide for a reasonable assurance of species persistence." For two species (*Hemphillia burringtoni* and *Hemphillia glandulosa* in WA Western Cascades) and the remaining portion of the range of *Megomphix hemphilli*, information was considered insufficient to determine this criterion (USDA, USDI 2000a, pp. 332 and 334; USDA, USDI 2001, p. 3; and USDA, USDI 2002).

Under Alternative 3, pre-disturbance or equivalent-effort surveys for the 34 species requiring them would no longer be required in non-late-successional and non-old-growth forest stands. Thirty-three of 34 species are believed to be closely associated with late-successional and old-growth forest as defined in USDA, USDI 2001 (pp. 55-56). There is insufficient information to determine if *Ancotrema voyanum* is closely associated with late-successional and old-growth forest (USDA, USDI 2000a, p. 332; USDA, USDI 2001, p. 3; and USDA, USDI 2003a). In many

cases, these species appear more closely associated with old-growth forest components, such as down wood, than with forest stands of a particular age, although the forest stand may provide critical microhabitat conditions (USDA, USDI 2003b). Species may often be found in younger stands that contain some of these components, and sites in these areas may provide important connectivity corridors among populations in fragmented old-growth stands that were once part of more contiguous habitat in the species' reference distribution. Lack of surveys could result in inadvertent loss of undiscovered sites in these stands. The potential environmental consequences to these mollusk species are discussed in more detail below.

Species are grouped for the purpose of comparing environmental consequences. The groupings are not intended to imply that this aspect of the analysis is the only criterion by which the alternatives would be judged. Previous analyses, either incorporated by reference or supplemented by this SEIS, contain relevant information regarding the alternatives.

Cryptomastix devia, Cryptomastix hendersoni, Fluminicola n. sp. 11, *Hemphillia burringtoni, Hemphillia glandulosa* (WA Western Cascades), *Hemphillia malonei* (in Washington), *Juga (O.)* n. sp. 2, *Lyogyrus* n. sp. 2, *Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Oreohelix* n. sp. 1, *Trilobopsis roperi, Trilobopsis tehamana,* and *Vespericola shasta*

This group of 14 species contains 8 terrestrial snails, 3 slugs, and 3 aquatic snails. These species range from very rare to uncommon and are found widely scattered across a relatively broad range or confined to a narrow range.

Under Alternative 1, *Cryptomastix devia, Cryptomastix hendersoni, Hemphillia burringtoni, Hemphillia glandulosa, Hemphillia malonei, Juga* (*O.*) n. sp. 2, *Lyogyrus* n. sp. 2, *Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Trilobopsis roperi,* and *Vespericola shasta* were predicted to have habitat sufficient to "stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" with moderate uncertainty (USDA, USDI 2000a, pp. 173 and 191). *Oreohelix* n. sp. 1 and *Trilobopsis tehamana* were predicted to have habitat sufficient to "stabilize in a pattern similar to reference distribution" with moderate and high uncertainty, respectively (USDA, USDI 2000a, pp. 173 and 191). Under Alternative 1, these 14 species would not be at a high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, these 14 species are assumed to be included in the Agencies' Special Status Species Programs (see Table 2-8). This includes both BLM and Forest Service listings for seven species in most or all of their range: *Cryptomastix devia, Cryptomastix hendersoni, Hemphillia burringtoni, Hemphillia malonei* in Washington, *Juga* (*O.*) n. sp. 2, *Lyogyrus* n. sp. 2, and *Trilobopsis tehamana*. Known sites for all of these species (in the Survey and Manage portion of their ranges) occur almost exclusively on National Forest System lands (ISMS database August 2002). Six other species would be listed as Sensitive by only the Forest Service: *Hemphillia glandulosa* in WA Western Cascades Province, *Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Oreohelix* n. sp. 1, *Trilobopsis roperi*, and *Vespericola shasta*. For 13 species, some known sites may be lost as site management requirements and management strategies are evaluated at a local scale. Site losses allowed under the Special Status Species Programs would be constrained by program objectives of maintaining species viability or avoiding contributing to the need to list a species under the ESA. *Fluminicola* n. sp. 11 would be listed as Bureau Sensitive in Oregon, covering the two known sites for this species. Both sites would be managed to avoid contributing to the need for listing under the ESA. Under Alternative 2, these 14 species would not be at a high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 3, all of these species except *Hemphillia malonei* would be included in the Survey and Manage Standards and Guidelines similar to Alternative 1. Removal of the pre-disturbance survey requirement in non-late-successional and non-old-growth forest stands for 11 of the species (all except the *Hemphillia* species) could result in loss of some sites. This could result in some loss of population connectivity and interaction. Under Alternative 3, *Hemphillia*

malonei would be managed as a Sensitive Species and site losses would be constrained as described under Alternative 2 above. These 14 species would not be at high risk of extirpation in the Northwest Forest Plan area under Alternative 3.

Megomphix hemphilli

This terrestrial snail occurs scattered across its range in western Oregon and southwest Washington. This species is closely tied to bigleaf maple habitats at relatively low elevations, particularly on the margins of the Willamette Valley and Oregon Coast Range (USDA, USDI 2003b). In the northern portion of its range (just over half of the area of the known range), this species is known from widely scattered sites and is considered rare (see Table 2-8). In the southern portion of its range, this species was originally placed in Category F, which does not require either pre-disturbance surveys or management of known sites. However, this category was determined to lead to "Habitat insufficient to support stable populations of the species" with high uncertainty (USDA, USDI 2000a, p. 191). Additional mitigation of "manage sites known as of 9/30/99" was considered to change the outcome for this species to allow stable populations (USDA, USDI 2001, p. 14).

Under Alternative 1, this species is expected to have habitat sufficient to "stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" with moderate uncertainty in the southern portion of the range and low uncertainty in the northern portion (USDA, USDI 2000a, p. 191, as amended by USDA, USDI 2001, p. 13). Under Alternative 1, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, this species is assumed to be listed as Forest Service Sensitive and Bureau Tracking throughout its range (see Table 2-8). Approximately 85 percent of the known sites for this species lie on BLM managed lands (ISMS database August 2002). Bureau Tracking status in Oregon does not provide any protection for known sites (BLM Manual 6840). As a result, in the northern portion of the species range loss of sites and population areas on BLM managed lands could reduce population interactions and lead to isolated populations or species extirpation from significant portions of the species range (i.e. extirpation from 20 percent or more of the area of the total species range, and/or loss of genetically or ecologically distinct populations). In the southern portion of the range, loss of sites may reduce opportunities for population interactions and lead to isolated populations. However, under Alternative 2, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 3, this species would continue to be managed under the Survey and Manage mitigation measure with modifications in the northern portion of its range. Because of this species' association with bigleaf maple trees, which may not necessarily occur in late-successional or old-growth stands, lack of pre-disturbance surveys in these areas may result in some loss of undiscovered sites. In the southern portion of its range, this species would be removed from the Survey and Manage mitigation measure and listed as Bureau Tracking and Forest Service Sensitive. As described under Alternative 2 above, loss of sites in the southern portion of the range may reduce opportunities for population interactions and lead to isolated populations. However, under Alternative 3, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Ancotrema voyanum, Helminthoglypta talmadgei, Monadenia chaceana, Monadenia fidelis minor, Pristiloma arcticum crateris, and *Prophysaon coeruleum* in Washington and California

This group of six species includes one slug (*Prophysaon coeruleum*) and five terrestrial snails that are considered rare to uncommon and are known from sites scattered widely across their ranges. *Prophysaon coeruleum* is currently considered rare in Washington and California. It was removed from the Survey and Manage list in Oregon because of reduced concern for persistence in that portion of its range (USDA, USDI 2001, p. 10). Although the California and Washington

portions of this species' range each represent less than 10 percent of the total range area, they may represent genetically or ecologically distinct populations or undescribed species (USDA, USDI 2000a, pp. 336-339).

Under Alternative 1, *Ancotrema voyanum*, *Monadenia chaceana*, and *Pristiloma arcticum crateris* are expected to have habitat sufficient to "stabilize in a pattern similar to reference distribution" with moderate (first two species) or low (last species) uncertainty (USDA, USDI 2000a, p. 191, as amended by USDA, USDI 2001, p. 13). *Helminthoglypta talmadgei*, *Monadenia fidelis minor*, and *Prophysaon coeruleum* in Washington and California are expected to have habitat sufficient to "stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" with moderate uncertainty (USDA, USDI 2000a, p. 191). Under Alternative 1, these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, five of these species would be listed as Bureau Sensitive throughout their ranges but would not be listed under the Forest Service Sensitive Species program (see Table 2-8): *Ancotrema voyanum* (known from California), *Helminthoglypta talmadgei* (California), *Monadenia chaceana* (Oregon and California), *Monadenia fidelis minor* (Oregon), and *Pristiloma arcticum crateris* (Oregon). The majority of known sites for all of these species, ranging from 100 percent (*Ancotrema voyanum* and *Monadenia fidelis minor*) to 77 percent (*Monadenia chaceana*), are located on National Forest System lands where the species would not be listed as Sensitive under Alternative 2. Management as Bureau Sensitive would apply to a small minority of the known sites for these species. Therefore, existing provisions of the Northwest Forest Plan and the addition of listing as Bureau Sensitive on BLM managed lands would not prevent or compensate for loss of known sites or population areas. Because of the widely scattered pattern of populations for all these species, loss of sites or population areas would reduce population interaction, connectivity, and normal biological function, and could result in extirpation from significant portions of the species range (i.e. extirpation from 20 percent or more of the area of the species range, and/or loss of genetically or ecologically distinct populations). However, because of the number of known sites and extent of the ranges of these species, under Alternative 2 these species would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 2, *Prophysaon coeruleum* would be listed as Sensitive for the Forest Service in Washington, but would not be listed for the Forest Service in California or for the BLM anywhere. Three known sites for this species are found in Washington on National Forest System lands. In California, existing provisions of the Northwest Forest Plan would not prevent or compensate for loss of known sites or population areas, leading to reduced opportunities for population interaction among the widely scattered known sites and possible extirpation of the species in California, resulting in loss of genetically or ecologically distinct populations of the species. However, under Alternative 2 this species would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 3, five of these species (all except *Helminthoglypta talmadgei*) would continue to be managed under the Survey and Manage mitigation measure with modifications. Removal of the pre-disturbance survey requirement in non-late-successional and non-old-growth stands for these species could result in inadvertent loss of some sites. Because of the widely scattered distribution of these species, this could result in some loss of population connectivity and interaction. *Helminthoglypta talmadgei* would not be managed under the Survey and Manage mitigation measure, but would be listed as Bureau Sensitive as described under Alternative 2. There is evidence of genetically and ecologically distinct populations within this species (Roth 2002), each of which occupy relatively small ranges. Because only two of the known sites for this species are found on BLM managed lands and would receive protection (ISMS database August 2002), loss of sites or population areas under Alternative 3 would reduce population interaction, connectivity, and normal biological function, and could result in extirpation from significant portions of the species range (including loss of genetically and ecologically distinct populations). However, under Alternative 3 these six species would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Deroceras hesperium

This terrestrial slug is characterized by rarity and isolated population(s). Since 1994, the understanding of species range has changed, but the species still appears rare. *Deroceras hesperium* is now known from four sites in southern Oregon, although it was previously considered to occur across northwestern Oregon and western Washington (USDA, USDI 1994a, Appendix J2).

Under Alternative 1, *Deroceras hesperium* was predicted to have habitat sufficient to "stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" (USDA, USDI 2000a, p. 191, as amended by USDA, USDI 2001, p.13). Under Alternative 1, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, *Deroceras hesperium* would be listed as Bureau Sensitive in Oregon/ Washington (see Table 2-8). With only four known sites, it is presumed that all three sites on BLM managed lands would be managed to meet the objective of not contributing to the need for listing under the ESA. The fourth site on National Forest System lands would not be protected under the Forest Service Sensitive Species Program, and it does not lie in a reserve land allocation (ISMS database). In addition, the Forest Service manages most of the federally managed land in the large historic range of this species. Any undiscovered sites in this area would be considered critical to maintaining the distribution of the species because of its rarity. Sites on National Forest System lands, if discovered, would not be protected under the Special Status Species Program. This species could lose one of its four known sites and be extirpated from significant portions of its range (i.e. extirpation from over half of the area of the species range, and/or loss of genetically or ecologically distinct populations). However, because of the protection provided to some of the existing known sites under Alternative 2, this species would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 3, this species would continue to be managed under the Survey and Manage mitigation measure with modifications. Equivalent-effort surveys would no longer be required in non-late-successional and non-old-growth stands, which may result in inadvertent loss of undiscovered sites. The habitat associations of this species are poorly known (USDA, USDI 2003b). Because of the rarity and widely scattered distribution of this species, loss of sites in younger stands could result in extirpation of distinct populations of the species. However, because of the protection provided to the existing known sites under Alternative 3, this species would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Monadenia infumata ochromphalus

This species is the product of a recent taxonomic revision combining the previous Survey and Manage species *Monadenia fidelis klamathica* and *Monadenia fidelis ochromphalus*, along with non-Survey and Manage taxa. It is characterized by a relatively larger number of known sites scattered over a moderate-sized range in California. This species (considered then as two taxa) received combined likelihood scores for Outcomes C and D ranging from 30 to 50 (USDA, USDI 1994a, Appendix J2), although new information has been gathered since 1994. The known range has approximately doubled since 1994 (USDA, USDI 1994a, Appendix J2; Terrestrial Mollusk Survey Protocol 2002), and the number of known sites for the two previous Survey and Manage species has increased from 1 to 73 for *M. f. klamathica* (19 in Reserves) and from 3 to 81 for *M. f. ochromphalus* (19 in Reserves) (USDA, USDI 1994a, Appendix J2 and ISMS database August 2002).

Under Alternative 1, this species is expected with moderate uncertainty to have sufficient habitat to "allow species to stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" (USDA, USDI 2000a, p. 191, as amended by USDA, USDI 2001, p. 13). Under Alternative 1, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, this species would not be included in the Agencies' Special Status Species Programs. While some sites or portions of these species' ranges may be protected by the provisions of the Northwest Forest Plan, analysis in 2000 and again in 2002 found that "All known sites or population areas [are] likely to be necessary to provide reasonable assurance of the taxon's persistence" for these two species (USDA, USDI 2001, Attachment 1, pp. 57-72, and USDA, USDI 2003a). Management under Alternative 2 would not prevent or compensate for loss of sites or population areas, leading to the likelihood of limitations on population interactions and extirpation from significant portions of the species range (i.e. extirpation from 20 percent or more of the area of the species range, and/or loss of genetically or ecologically distinct populations). Because of the number of sites and extent of range of this species, under Alternative 2, it would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 3, this species would continue to be managed under the Survey and Manage mitigation measure with modifications. Removal of the pre-disturbance survey requirement in non-late-successional and non-old-growth stands for the species could result in inadvertent loss of some sites. Under Alternative 3, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Fluminicola n. sp. 3, *Fluminicola seminalis,* and *Lyogyrus* n. sp. 1

These three aquatic snails are characterized by a low to moderate number of known sites (5, 15, and 61, respectively) widely scattered over somewhat limited ranges. *Fluminicola* n. sp. 3 was previously known from one cluster of sites in southern Oregon (USDA, USDI 1994a, Appendix J2), and has since been found in another cluster of sites in California. New sites for *Fluminicola seminalis* discovered in southern Oregon have expanded the known range of this species. Few sites have been discovered since 1994 despite pre-disturbance and strategic survey requirements. *Lyogyrus* n. sp. 1 occupies a narrow range in the Mt. Hood National Forest and Columbia Gorge. It is unlikely that large undiscovered population areas exist for any of these species. The Northwest Forest Plan Final SEIS (Appendix J2) noted *Fluminicola seminalis* is "now about 95 percent extirpated from its former range in the Sacramento River." As aquatic snails, these species receive protection from the Aquatic Conservation Strategy. However, concerns for persistence remained (USDA, USDI 1994, Appendix J2, and USDA, USDI 2000a). These concerns included factors that could directly or indirectly affect local populations while still meeting overall Aquatic Conservation Strategy goals, such as livestock grazing or activities outside the riparian buffer zone, particularly around small wetlands or springs where the riparian buffer covers only the extent of riparian vegetation.

Under Alternative 1, *Fluminicola* n. sp. 3 was predicted to have habitat sufficient to "stabilize in a pattern similar to reference distribution" with moderate uncertainty (USDA, USDI 2000a, p. 191). *Fluminicola seminalis* and *Lyogyrus* n. sp. 1 were predicted to have habitat sufficient to "stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" with moderate uncertainty (USDA, USDI 2000a, p. 191). Under Alternative 1, these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, *Fluminicola* n. sp. 3 would be listed as Sensitive by the BLM in Oregon, but not by either agency in California. This would remove management for one of the two known population areas of this species (sites in Oregon are on BLM managed land). Loss of the California population would substantially affect the distribution of the species. *Fluminicola seminalis* would be listed as Forest Service Sensitive in California and Bureau Tracking in Oregon (see Table 2-8). Six of the known sites are on National Forest System lands in California. One additional known site is on BLM managed lands in California, which would not be protected under the Special Status Species Programs. All known sites on federally managed land in Oregon are on National Forest System lands, which would not be protected under the Special Status Species Programs. Bureau Tracking status in Oregon does not provide any management direction for sites that may be discovered on BLM managed lands (BLM Manual 6840). *Lyogyrus* n. sp. 1 would be listed as Sensitive by the BLM but not by the Forest Service, although all known sites for this species are found on Forest Service managed lands. As a result, only a minority of known

sites would receive protection through the Special Status Species Programs under Alternative 2. Because of the widely scattered distribution of these three species, loss of any known sites would have a substantial effect on population interactions and the distribution of the species as a whole, and may lead to extirpation of the species from significant portions of the range (i.e. extirpation from over half of the area of the species range, and/or loss of genetically or ecologically distinct populations). However, because of the protection afforded by the Aquatic Conservation Strategy and the partial listing as Sensitive, under Alternative 2 these species would not be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 3, these species would continue to be managed under the Survey and Manage mitigation measure with modifications. Because these species are aquatic snails, much of the habitat for these species may no longer require pre-disturbance surveys. The association of these species with late-successional and old-growth forest typically depends on stand conditions at a larger scale, which may not be considered in assessment of survey requirements. This may result in inadvertent loss of undiscovered sites or populations, although it is unlikely that significant undiscovered populations are extant. Because of the protection afforded by the Aquatic Conservation Strategy and management in Survey and Manage, under Alternative 3 these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Fluminicola n. sp. 14, 15, 16, 17, 18, 19, and 20; *Juga (O.)* n. sp. 3; *Lyogyrus* n. sp. 3; and *Vorticifex* n. sp. 1

All 10 species in this group are aquatic snails known from a small number of sites in a narrow range. Number of known sites ranges from 1 (*Fluminicola* n. sp. 19 and *Lyogyrus* n. sp. 3) or 2 (*Fluminicola* n. sp. 17 and 20 and *Vorticifex* n. sp. 1) to 17 (*Fluminicola* n. sp. 16). There is no new information since 1994 that would alter the evaluation in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a). Nine of these species have all of their known sites outside of Late-Successional Reserves, Administratively Withdrawn Areas, and Congressionally Reserved Areas. The exception is *Fluminicola* n. sp. 14, with 1 of 12 known sites in a Late-Successional Reserve. The known ranges of all of these species have not substantially changed since 1994 despite pre-disturbance and strategic survey requirements, so the likelihood of significant undiscovered populations appears low (USDA, USDI 1994a, Appendix J2 and ISMS database August 2002). As aquatic snails, these species receive protection from the Aquatic Conservation Strategy (USDA, USDI 1994a). However, concerns for persistence remained (USDA, USDI 1994, Appendix J2, and USDA, USDI 2000a). These concerns included factors that could directly or indirectly affect local populations while still meeting overall Aquatic Conservation Strategy goals, such as livestock grazing or activities outside the riparian buffer zone, particularly around small wetlands or springs where the riparian buffer covers only the extent of riparian vegetation. These species are rare and have narrow ranges.

Under Alternative 1, two of these species are expected to have sufficient habitat to "stabilize in a pattern similar to reference distribution" with moderate uncertainty (*Fluminicola* n. sp. 14 and *Vorticifex* n. sp. 1). The remaining seven species are expected to "stabilize in a pattern altered from reference distribution," all with moderate uncertainty (USDA, USDI 2000a, p. 191, as amended by USDA, USDI 2001, p. 13). Under Alternative 1, these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, these 10 species would not be included in the Agencies' Special Status Species Programs (see Table 2-8). Although these species are not at high risk of range-wide extirpation because of the protection of the Aquatic Conservation Strategy and Riparian Reserves, the loss of even a single site could result in range-wide extirpation in the Northwest Forest Plan area because of the rarity and narrow ranges of these species.

Under Alternative 3, these species would continue to be managed under the Survey and Manage mitigation measure with modifications. Because these species are aquatic snails, much of the habitat for these species may no longer require pre-disturbance surveys. The association of these species with late-successional and old-growth forest typically depends on stand conditions

at a larger scale, which may not be considered in assessment of survey requirements. This may result in inadvertent loss of undiscovered sites or populations, although it is unlikely that significant undiscovered populations are extant. Because of the protection afforded by the Aquatic Conservation Strategy and management under the Survey and Manage mitigation measure, under Alternative 3, these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Hemphillia pantherina

This rare slug species is known from only one historic site in a riparian zone, although it is unknown if this population is still extant. The historic site and the species' presumed historic range lie entirely on National Forest System lands in the Northwest Forest Plan area in Washington. In 2000, it was placed in Category B, which requires management of known sites but not pre-disturbance surveys. This was determined to lead to "Habitat insufficient to support stable populations of the species" with high uncertainty (USDA, USDI 2000a, p. 191). Additional mitigation of equivalent-effort surveys, added in the 2001 Record of Decision, was considered to change the outcome for this species sufficiently to allow stable populations with moderate uncertainty by providing protection for undiscovered sites (USDA, USDI 2000a, p. 191 and USDA, USDI 2001, p. 14). If this species is extinct, comparison of alternatives is moot. The comparison of alternatives below assumes that the species survives, either at the historic location and/or at other locations in the vicinity.

Under Alternative 1, this species is expected with moderate uncertainty to have sufficient habitat to "allow species to stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" (USDA, USDI 2000a, p. 191, as amended by USDA, USDI 2001, p. 13). Under Alternative 1, this species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, this species would not be listed under the Agencies' Special Status Species Programs (see Table 2-8). The historic location would not be managed for the species, and no surveys would be conducted prior to habitat-disturbing activities. Activities allowed within riparian buffer zones may cause risk to the persistence of the local population at the single known site. Because of the rarity of this species, loss of single sites could result in species extirpation. Under Alternative 2, this species would be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 3, this species would be managed under the Survey and Manage mitigation measure with modifications, receiving continued equivalent-effort surveys and management of known sites in late-successional and old-growth habitat. However, this species may persist at only a single site. Other sympatric Survey and Manage species in this genus (*H. burringtoni* and *H. glandulosa*) have been found associated with old-growth components in younger stands, habitats which would not require equivalent-effort surveys for this species. There is insufficient information to determine whether lack of pre-disturbance surveys in non-late-successional and non-old-growth stands under Alternative 3 poses a high risk of range-wide extirpation in the Northwest Forest Plan area because it is not known whether this species occurs in younger stands and the mechanisms that has allowed the sympatric species to persist in younger stands in the presence of various disturbances in the past are unknown.

Vertigo n. sp. and *Vespericola pressleyi*

These two rare terrestrial snails are known from a small number of known sites in a very narrow range. The single known site for *Vertigo* n. sp. lies on non-federal land adjacent to the Olympic National Forest, in an area subject to substantial timber harvest. Adjacent federally managed land is split between Late-Successional Reserve and Adaptive Management Area land allocations. Most of the known sites for *Vespericola pressleyi* (18 out of 21) lie outside Late-Successional Reserves or Administratively Withdrawn Areas, or Congressionally Reserved Areas. The known range and number of sites for these species have not changed substantially since 1994, despite pre-

disturbance survey requirements, so the likelihood of significant undiscovered populations appears low (USDA, USDI 1994a, Appendix J2 and ISMS database August 2002).

Under Alternative 1, *Vespericola pressleyi* is expected with moderate uncertainty to have sufficient habitat to "allow species to stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions" (USDA, USDI 2000a, p. 191). *Vertigo* n. sp. is predicted to have sufficient habitat to "stabilize in a pattern similar to reference distribution" with low uncertainty (USDA, USDI 2000a, p. 191). Under Alternative 1, these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Under Alternative 2, these species are assumed not to be included in the Agencies' Special Status Species Programs (see Table 2-8). Because of the rarity and narrow range of these species, loss of a few sites could result in species extirpation. Under Alternative 2, these species would be at high risk of range-wide extirpation in the Northwest Forest Plan area.

Under Alternative 3, these species would be managed under the Survey and Manage mitigation measure with modifications. Some inadvertent loss of undiscovered sites in younger stands may occur, although significant populations of these species are not expected to occur in younger stands. Under Alternative 3, these species would not be at high risk of extirpation in the Northwest Forest Plan area.

Summary and Possible Mitigation

In summary, 14 of the 39 species (*Cryptomastix devia, Cryptomastix hendersoni, Fluminicola* n. sp. 11, *Hemphillia burringtoni, Hemphillia glandulosa* in WA Western Cascades, *Hemphillia malonei* in Washington, *Juga* (*O.*) n. sp. 2, *Lyogyrus* n. sp. 2, *Monadenia troglodytes troglodytes, Monadenia troglodytes wintu, Oreohelix* n. sp. 1, *Trilobopsis roperi, Trilobopsis tehamana*, and *Vespericola shasta*) would not be at high risk of extirpation in the Northwest Forest Plan area under any alternative. These species would receive similar management under each alternative because of the management provided by the Survey and Manage or Special Status Species Programs, and species' outcomes are expected to be similar in terms of population distribution and interaction. Although some known sites may be lost under Alternative 2 as site management requirements and management strategies are evaluated at a local scale, site losses would be constrained by program objectives.

Nine of the 39 species (*Ancotrema voyanum, Deroceras hesperium, Helminthoglypta talmadgei, Megomphix hemphilli, Monadenia chaceana, Monadenia fidelis minor, Monadenia infumata ochromphalus, Pristiloma arcticum crateris,* and *Prophysaon coeruleum* in Washington and California) would not be at high risk of range-wide extirpation in the Northwest Forest Plan area under any alternative. However, these terrestrial species tend to have widely scattered known sites or populations and would not be included in the Special Status Species Programs throughout most or all of their range under Alternative 2. Under Alternative 1, these species are expected to stabilize in a pattern either similar to or altered from reference distribution. Under Alternative 2, loss of sites or population areas would reduce population interaction, connectivity, and normal biological function, and could result in extirpation from significant portions of the species range. Under Alternative 3, outcomes for eight of these species are expected to be similar to Alternative 1, while the outcome for *Helminthoglypta talmadgei* is expected to be similar to Alternative 2.

Thirteen of the 39 species (*Fluminicola* n. sp. 3, 14, 15, 16, 17, 18, 19, and 20; *Fluminicola seminalis*; *Juga* (*O.*) n. sp. 3; *Lyogyrus* n. sp. 1 and 3; and *Vorticifex* n. sp. 1) would not be at high risk of extirpation in the Northwest Forest Plan area under any alternative. However, these species are known from small numbers of sites in limited ranges and are only partially or not at all included in the Special Status Species Programs under Alternative 2. Under Alternative 1, these species are expected to stabilize in a pattern either similar to or altered from reference distribution. Under Alternative 3, pre-disturbance survey requirements may be removed for significant portions of the species' habitat. Under all alternatives, the Riparian Reserves and

Aquatic Conservation Strategy are expected to provide substantial protection for these species. Because of the rarity and narrow ranges of these species, loss of even a single site could result in extirpation in the Northwest Forest Plan area.

For three of the species (*Hemphillia pantherina*, *Vertigo* n. sp., and *Vespericola pressleyi*), the alternatives differ substantially regarding a high risk of extirpation in the Northwest Forest Plan area. Under Alternative 1, these species are expected to stabilize in a pattern either similar to or altered from reference distribution. Under Alternative 2, because of the rarity and narrow ranges of these species and lack of inclusion in the Special Status Species Programs, these species have a high risk of range-wide extirpation in the Northwest Forest Plan area. Under Alternative 3, there is insufficient information to determine if *Hemphillia pantherina* would be at high risk of extirpation in the Northwest Forest Plan area. The other two species are expected to have outcomes under Alternative 3 similar to those under Alternative 1.

Under all alternatives, 14 of 39 mollusk species would not be at high risk for extirpation in the Northwest Forest Plan area. The high risk of extirpation is not a result of federal actions.

Three species (*Hemphillia pantherina*, *Vertigo* n. sp., and *Vespericola pressleyi*) would not be at high risk of extirpation in the Northwest Forest Plan area under Alternative 1, but would be at high risk of extirpation under Alternative 2. Mitigation of these effects under Alternative 2 could include management of known sites and pre-project clearances. These mitigations could be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

For nine terrestrial mollusk species, Alternative 2 (and Alternative 3 for *Helminthoglypta talmadgei*) may result in loss of sites or population areas that could result in extirpation from significant portions of the species range in the Northwest Forest Plan area. Mitigation of these effects under Alternative 2 could include management of known sites not protected by reserves. Mitigation for all but *Helminthoglypta talmadgei* could also include pre-project clearances. These mitigations would be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

Amphibians

Background and Affected Environment

Under Alternative 1, four salamanders are included in the Survey and Manage Standards and Guidelines: Larch Mountain, Shasta, Siskiyou Mountains, and Van Dyke's in the Cascade Range. Under Alternative 2, these four salamanders are included in the Agencies' Special Status Species Programs (see Table 2-8), and three of four species are included across their full range on federally managed lands. The Larch Mountain salamander is Bureau Assessment in the Oregon/Washington BLM and is Sensitive in Forest Service Region 6. The Shasta salamander is Bureau Sensitive in the California BLM and is included as Forest Service Sensitive in Region 5. The Siskiyou Mountains salamander is Bureau Sensitive in Oregon/Washington BLM and Sensitive in Oregon in Forest Service Region 6 and in Region 5. The Van Dyke's salamander is Sensitive in Washington in Forest Service Region 6. Under Alternative 3, these four salamanders would be retained under the Survey and Manage Standards and Guidelines similar to Alternative 1 with the exception that the northern population of Siskiyou Mountains salamander, which includes sites north of the Siskiyou Mountains crest, would not be retained under the Survey and Manage mitigation measure. Instead, under Alternative 3, this population would be included in the Agencies' Special Status Species Programs similar to Alternative 2. The Survey and Manage Standards and Guidelines and the Agencies' Special Status Species Programs have similar strategies; they both provide for management of sites and surveys.

These four salamanders are found in terrestrial environments without an aquatic life history stage. Populations of interacting individuals may be comprised of numerous sites. Knowledge regarding the known sites and range of these species has increased since 1994. During this time, the known range of these species has increased 51 percent for the Shasta salamander, 5 percent for the Van Dyke's salamander, 155 percent for the Larch Mountain salamander, and 91 percent for the Siskiyou Mountains salamander.

Although these four salamanders have met criteria for late-successional and old-growth forest associations, such association does not preclude their occurrence in younger stands. Terrestrial salamander habitat associations are often a mix of microhabitat to landscape-scale parameters, which may include an array of environmental variables in addition to late-successional and old-growth forests. They may have greater abundances in late-successional and old-growth forest and/or be associated with elements of late-successional and old-growth forest that may be retained in legacy conditions in younger stands. Furthermore, they may occur in non-late-successional and non-old-growth forest stands if other site conditions are lessening the deleterious effects of past disturbances (e.g., cooler surface microclimates of north facing slopes and deep rocky substrates, or wetter conditions of local surface hydrology).

The knowledge gained about the Shasta, Van Dyke's, Larch Mountain, and Siskiyou Mountains salamanders' biology, distributions, and habitats from pre-disturbance and strategic surveys, and various research efforts, has been used in adaptive management. This has resulted in improved survey protocols with greater likelihood of detecting animals which has reduced inadvertent loss of sites. Improved knowledge of species' distributions and habitat associations has resulted in a perceived risk reduction for some salamanders. For example: (1) the Del Norte salamander was removed from the Survey and Manage Standards and Guidelines in 2002; (2) the Siskiyou Mountains salamander was moved to a different Survey and Manage category; and, (3) rarity of the Larch Mountain, Van Dyke's, and Shasta salamanders has been confirmed.

Shasta Salamander (*Hydromantes shastae*)

Shasta salamander occurs only in California near Shasta Lake. There are 54 known sites on federally managed lands. The current range extends over 250,000 acres. Federally managed lands are primarily National Forest System lands and comprise 68 percent of the range. Less than 1 percent of the range occurs on BLM managed lands. Habitat includes limestone outcrops, other rock sources, and nonrock habitats (Olson 2000; Lewendal 1995; Lindstrand 2000; Nauman and Olson 2002; and North State Resources, Inc. 2002). Potential habitat has not been well surveyed (Olson and Lewendal 2000).

Van Dyke's Salamander (*Plethodon vandykei*)

This species occurs in the Olympic Peninsula, in southwestern Washington, and in the Cascade Range. Only the populations in the Cascade Range are included in the Survey and Manage Standards and Guidelines. There are 29 known sites on federally managed lands in the Cascades and relatively few new sites have been found since 1994. The distribution of the species is not well known. Although habitat is broad, including caves, talus, streams, and lakes, this species appears to have a strong association with riparian environments, occurring in association with streams and seeps, and including apparent affinities for high gradient and headwater areas. Sites are known up to an elevation of 5,200 feet.

Larch Mountain Salamander (*Plethodon larselli*)

Although originally thought to be restricted to the Columbia River Gorge, the range of the Larch Mountain salamander now extends 135 miles in length, north and south along the Cascade Range, and 40 miles wide, east to west. Since 1980, the total area encompassed by known sites has increased almost 10-fold (Nauman and Olson 1999). There are 87 known sites on federally managed lands. The fact that relatively few sites have been identified since 1993 despite survey

efforts (i.e., 461 negative surveys, ISMS database) supports the rarity of this animal (USDA, USDI Species Review Panel 2001). This animal occurs in a variety of habitat types including talus and rocky slopes within a dense conifer overstory (Herrington and Larsen 1985). The majority of known sites for this species reflect narrow habitat and microclimate requirements. Known sites occur to an elevation of 4,100 feet.

Siskiyou Mountains Salamander (*Plethodon stormi*)

The known range of the Siskiyou Mountains salamander is limited to a small area near the Oregon-California border, and has increased substantially from 1993. There are 173 known sites including the 126 sites found since 1993. Habitat is forested, rocky substrates under a closed canopy that provides cool, moist microclimates (Ollivier et al. 2001). The species can occur in all seral stages but the majority of sites are in older forests (mature and old growth) and abundances are higher in older forests (USDA, USDI Species Review Panel 2000 and Nussbaum 1974).

The ecology and biological diversity of this animal appears to differ north and south of the Siskiyou Mountain crest near the Oregon-California border. The range for this species has been split at the Siskiyou crest for management considerations. North of the crest there are 143 sites and south of the Siskiyou crest there are 30 sites. In the south, genetically distinct populations have been identified. At the southernmost extent of the species range, genetic analyses of animals from three sites have a revealed a distinct population that is a completely separate lineage (Scott Bar group). This population is under taxonomic review and its distribution is under study.

Environmental Consequences

Shasta salamander

Alternatives 1 and 3 likely would provide sufficient habitat (including known sites) to allow the Shasta salamander to stabilize in a pattern similar to reference distribution on federally managed lands in the Northwest Forest Plan area (USDA, USDI 2000a, pp. 340-357). This result is analogous to Outcome A from FEMAT; thus, if a similar rating process were conducted now, this amphibian species would have a preponderance of points in Outcome A. This salamander would not be at a high risk for extirpation under Alternative 1 because known sites would be managed.

Under Alternative 3, pre-disturbance surveys would not be conducted in non-late-successional and non-old-growth forest. Lack of pre-disturbance surveys in non-late-successional and non-old-growth forest stands increases the risk of inadvertent loss of such sites. Population or subpopulation losses are also possible. There is uncertainty regarding the extent that this would affect stable, well-distributed populations.

Under Alternative 2, the Shasta salamander is assumed to be included in the Agencies' Special Status Species Programs as Bureau Sensitive and Forest Service Sensitive in California (see Table 2-8). The Shasta salamander was given a FEMAT rating of 0-40-40-20 (see Background for Effect Analysis section). The rating reflected an extremely localized distribution and risk of extirpation due to small population sizes (USDA, USDI 1994a, Appendix J2, p. J2-426). The rating was not primarily a result of alternative design or federal management (USDA, USDI 1994a, p. 3&4-175). No standards and guidelines could be devised that would fully eliminate the risks of extirpation from federally managed lands (USDA, USDI 1994a, p. 3&4-176). The Shasta salamander did not meet the Northwest Forest Plan persistence criterion to maintain stable, well-distributed populations (USDA, USDI 2001, Attachment 1, p. 3) from implementation of other elements of the Northwest Forest Plan (e.g., land allocations, down wood).

Under Alternative 2, discretion in survey methodology and in the management of known sites under the Special Status Species Programs results in uncertainty whether all sites would be detected and managed. This, in turn, creates some uncertainty in the analysis of environmental

consequences because the inadvertent loss of undetected sites may affect the maintenance of stable, well-distributed populations. The management discretion in the Special Status Species Programs is constrained by program objectives that include maintaining viable populations in habitats distributed throughout the species range and ensuring that actions do not contribute to the need to list under the ESA. Alternative 2 does not have a specified process to improve knowledge of the species that would facilitate adaptive management.

Most of the federal range of the Shasta salamander occurs on National Forest System lands (more than 99 percent) and about 66 percent occurs in Matrix with 33 percent occurring in Administratively Withdrawn Areas (Nauman and Olson 1999). These Administratively Withdrawn Areas are the Shasta Lake National Recreation Area, where vegetation-altering activities such as timber harvest do not generally occur, although fuels reduction activities such as prescribed burning for wildlife habitat does occur. In addition to the Forest Service Sensitive Species listing for the Shasta salamander, a "Comprehensive Species Management Plan" is maintained by the Shasta Trinity National Forest (Bogener and Brouha 1979).

The Comprehensive Species Management Plan includes maintaining known sites and populations. Although the comprehensive plan includes an adaptive management provision, it does not include a specified process to fill information gaps (e.g., discrete population boundaries, species range, habitat associations), and it has not been periodically revised as originally envisioned. The outdated habitat definition and survey procedures included in the comprehensive plan create some uncertainty in predicting environmental consequences.

Alternative 2 would maintain stable, well-distributed Shasta salamander populations due to the existence of a comprehensive plan. Currently, the comprehensive plan has some limits that may result in loss of sites and populations. The Shasta salamander would not be at a high risk for extirpation under Alternative 2.

Van Dyke's salamander

Alternatives 1 and 3 likely would provide sufficient habitat (including known sites) to allow the Van Dyke's salamander to stabilize in a pattern similar to reference distribution on federally managed lands in the Northwest Forest Plan area (USDA, USDI 2000a, pp. 340-357). This result is analogous to Outcome A from FEMAT; thus, if a similar rating process were conducted now, this amphibian species would have a preponderance of points in Outcome A. This salamander would not be at a high risk for range-wide extirpation in the Northwest Forest Plan area under Alternative 1 because known sites would be managed.

Under Alternative 3, pre-disturbance surveys would not be conducted in non-late-successional and non-old-growth forest stands which may lead to inadvertent loss of some sites and populations. Lack of pre-disturbance surveys in non-late-successional and non-old-growth forest stands increases the risk of inadvertent loss of such sites. Population or subpopulation losses are also possible. There is uncertainty regarding the extent that this would affect stable, well-distributed populations.

Under Alternative 2, Van Dyke's salamander is assumed to be included in the Special Status Species Program as Forest Service Sensitive in Washington. The Van Dyke's salamander (Cascades populations) was given a FEMAT rating of 0-20-58-23 (see Background for Effect Analysis section). The rating reflected the species' naturally patchy distribution and it was thought that additional habitat protection would not increase its score (USDA, USDI 1994a, Appendix J2, p. J2-420). The Van Dyke's salamander did not meet the persistence criterion to maintain stable, well-distributed populations (USDA, USDI 2001, Attachment 1, p. 3). Due to the few known sites of this animal, loss of even a single site may pose a risk to maintaining stable, well-distributed populations throughout the species range. Current information indicates that Riparian Reserves under the Northwest Forest Plan provide mitigation for this species in areas where it occurs along stream banks and in seeps. The Van Dyke's salamander would not be at a high risk for range-wide extirpation in the Northwest Forest Plan area under Alternative 2.

Under Alternative 2, discretion in survey methodology and in the management of known sites under the Special Status Species Programs results in uncertainty whether all sites would be detected and managed. This, in turn, creates some uncertainty in the analysis of environmental consequences because the inadvertent loss of undetected sites may affect the maintenance of stable, well-distributed populations. The management discretion in the Special Status Species Programs is constrained by program objectives that include maintaining viable populations in habitats distributed throughout the species range and ensuring that actions do not contribute to the need to list under the ESA. Alternative 2 does not have a specified process to improve knowledge of the species that would facilitate adaptive management.

Larch Mountain Salamander

Alternatives 1 and 3 likely would provide sufficient habitat (including known sites) to allow the Larch Mountain salamander to stabilize in a pattern similar to reference distribution on federally managed lands in the Northwest Forest Plan area (USDA, USDI 2000a, pp. 340-357). This result is analogous to Outcome A from FEMAT; thus, if a similar rating process were conducted now, this species would have a preponderance of points in Outcome A. This salamander would not be at a high risk for range-wide extirpation in the Northwest Forest Plan area under Alternative 1 because known sites would be managed.

Under Alternative 3, pre-disturbance surveys would not be conducted in non-late-successional and non-old-growth forest stands which may lead to inadvertent loss of some sites and populations. Lack of pre-disturbance surveys in non-late-successional and non-old-growth forest stands increases the risk of inadvertent loss of such sites. Population or subpopulation losses are also possible. There is uncertainty regarding the extent that this would affect stable, well-distributed populations.

Under Alternative 2, Larch Mountain salamander is assumed to be included in the Special Status Species Program as Forest Service Sensitive in Region 6 and Bureau Assessment in Oregon and Washington (see Table 2-8). The Larch Mountain salamander was given a FEMAT rating of 75-20-5-0 (see Background for Effect Analysis section). The rating was based on the fact that under Option 9 in FEMAT the species: (1) was provided protection buffers; (2) was rare and locally endemic; (3) might be a relict species susceptible to extirpation through catastrophic events; and, (4) distribution is very poorly known (USDA, USDI 1994a, Appendix J2, p. J2-423). There are 87 federally managed sites occurring across 4 million acres. Away from the Columbia River Gorge, there are 55 federally managed sites.

Discretion in survey methodology and in the management of known sites under the Special Status Species Programs results in uncertainty whether all sites would be detected and managed. This, in turn, creates some uncertainty in the analysis of environmental consequences because the inadvertent loss of undetected sites may affect the maintenance of stable, well-distributed populations. The management discretion in the Special Status Species Programs is constrained by program objectives that include maintaining viable populations in habitats distributed throughout the species range and ensuring that actions do not contribute to the need to list under the Endangered Species Act. Alternative 2 does not have a specified process to improve knowledge of the species that would facilitate adaptive management.

The Larch Mountain salamander did not meet the Survey and Manage persistence criterion to maintain stable, well-distributed populations from implementation of other elements of the Northwest Forest Plan (e.g., land allocations, down wood) (USDA, USDI 2001, Attachment 1, p. 3). However, the extent of federally managed sites and potential range in reserve land allocations (e.g., north of the Gorge, 34 of 55 federal sites are in reserves) is expected to be beneficial for this animal, although some of these reserved lands are not suitable habitat and forest management activities in reserves may pose risks to site-level persistence (Olson 2000). Due to the few known sites of this animal, loss of even a single site may pose a risk to maintaining stable, well-distributed populations throughout the species range; this is particularly true away from the Columbia River Gorge where sites are patchily distributed. The Larch Mountain salamander

would not be at a high risk for range-wide extirpation in the Northwest Forest Plan area under Alternative 2.

Siskiyou Mountains Salamander

Alternatives 1 and 3 likely would provide sufficient habitat (including known sites) to allow the southern population of the Siskiyou Mountains salamanders to stabilize in a pattern similar to reference distribution on federally managed lands in the Northwest Forest Plan area (USDA, USDI 2000a, pp. 340-357). This result is analogous to Outcome A from FEMAT; thus, if a similar rating process were conducted now, this species would have a preponderance of points in Outcome A. This salamander would not be at a high risk for range-wide extirpation in the Northwest Forest Plan area under Alternative 1 because known sites would be managed. However, in the south, the Scott Bar population of the Siskiyou Mountains salamander that is known from only three sites would be at high risk of extirpation due to stochastic events.

Under Alternative 3, pre-disturbance surveys would not be conducted in non-late-successional and non-old-growth forest stands which may lead to inadvertent loss of some sites and populations. Lack of pre-disturbance surveys in non-late-successional and non-old-growth forest stands increases the risk of inadvertent loss of such sites. Population or subpopulation losses are also possible. There is uncertainty regarding the extent that this would affect stable, well-distributed populations.

Under Alternative 3, the environmental consequences for the northern population of the Siskiyou Mountains salamander would be similar to Alternative 2.

Under Alternative 2, Siskiyou Mountains salamander is assumed to be included in the Special Status Species Program as Forest Service Sensitive in Oregon and Region 5, and Bureau Sensitive in California. Similar management would occur under Alternative 3 for the northern population of the Siskiyou Mountains salamander. The Siskiyou Mountains salamander was given a rating of 50-30-15-5 (see Background for Effect Analysis section). The rating reflected its naturally patchy distribution and was not primarily a result of alternative design or federal management (USDA, USDI 1994a, Appendix J2, p. J2-426). The species has an extremely small range. Because of its small population size, there was expected to be some risk of extirpation regardless of protective measures undertaken (USDA, USDI 1994a, p. 3&4-177, and Appendix J2, p. J2-427). Of the 173 federally managed sites, 143 occur north and 30 occur south of the Siskiyou crest, a boundary which delineates distinct management units based on ecology and genetics. Three sites south of the crest are known to represent a distinct genetic lineage that is under taxonomic review.

Discretion in survey methodology and in the management of known sites under the Special Status Species Programs results in uncertainty whether all sites would be detected and managed. This, in turn, creates some uncertainty in the analysis of environmental consequences because the inadvertent loss of undetected sites may affect the maintenance of stable, well-distributed populations. The management discretion in the Special Status Species Programs is constrained by program objectives that include maintaining viable populations in habitats distributed throughout the species range and ensuring that actions do not contribute to the need to list under the ESA. Alternative 2 does not have a specified process to improve knowledge of the species that would facilitate adaptive management.

The Siskiyou Mountains salamander did not meet the Survey and Manage persistence criterion to maintain stable, well-distributed populations from implementation of other elements of the Northwest Forest Plan (e.g., land allocations, down wood) (USDA, USDI 2001, Attachment 1, p. 3 and USDA, USDI 2002). In the north, most of the federal range occurs within an Adaptive Management Area, where programmed timber harvest activities can occur. Less than 10 percent of the high quality habitat is in reserves and much of this range is suitable habitat for the species (Clayton et al. 2002).

In the south, the animal is patchier in distribution, with fewer sites. Also, a new genetic population has been identified (from three sites, Scott Bar group) (Mead et al. 2002), so maintenance of distinct populations is important. Pre-disturbance surveys in the Agencies' Special Status Species Programs would help avert site losses due to land management activities if the species occupancy at sites were recognized and managed to reduce risks. Due to the patchy occurrence in the south, loss of individual sites could reduce the known species distribution substantially.

The Agencies' Special Status Species Programs would help provide a reasonable assurance of maintaining stable, well-distributed populations if all occupied sites were managed for site persistence. In the north, under Alternative 1, identification of high-priority sites for management can achieve this same objective, and the process to identify such sites has been initiated. Northern and southern groups of the Siskiyou Mountains salamander would not be at a high risk for extirpation under Alternative 2; however, in the south, the Scott Bar population that is known from only three sites would be at high risk of extirpation due to stochastic events.

Summary

For the Shasta, Van Dyke's, Larch Mountain, and the southern population of the Siskiyou Mountains salamander, Alternatives 1 and 3 would achieve stable, well-distributed populations, and would provide specified mechanisms to improve knowledge of the species that would facilitate adaptive management. Some site losses of these species are expected under Alternative 3; however, it is uncertain whether this would affect stable, well-distributed populations. Similarly, Alternative 2 for all four species and Alternative 3 for the northern population of the Siskiyou Mountains salamanders would achieve stable, well-distributed populations; however, there is some uncertainty created by discretionary procedures and lack of a specified mechanism to improve knowledge. Under Alternatives 1, 2, and 3, none of the four salamander species would be at a high risk of range-wide extirpation in the Northwest Forest Plan area; however, the Scott Bar population of the Siskiyou Mountains salamander would be at high risk of extirpation.

Mitigation is not proposed for the Scott Bar population of the Siskiyou salamander because the risk to the three known sites is due to stochastic events. Improved knowledge of this population (e.g., distribution, abundance, and habitat) through strategic surveys, under Alternatives 1 and 3, may alter the perception of its risk.

Late-Successional Birds

Background and Affected Environment

The Northwest Forest Plan Final SEIS and its supporting documents addressed the habitat needs of 36 bird species which were identified as closely associated with late-successional and old-growth forests (USDA, USDI 1994a). Additional discussion of background and affected environment is contained in FEMAT and the Survey and Manage Final SEIS 2000.

Environmental Consequences

Analyses and conclusions relevant to all alternatives in this SEIS include that Alternative 9 of the Northwest Forest Plan Final SEIS adequately provides for the majority of these species (USDA, USDI 1994a, Table 3&4-29, p. 3&4-179). These positive assessments for late-successional bird species were due to the provision of Congressionally Reserved Areas, Late-Successional Reserves, Riparian Reserves, watershed analysis, and the retention of green trees, snags, and coarse woody debris in areas of timber harvest in Matrix and Adaptive Management Area land allocations.

None of these 36 bird species were included as Survey and Manage species. The conclusion of FEMAT regarding Option 9 and the Northwest Forest Plan Final SEIS regarding Alternative 9 was that these late-successional birds would be stable and well distributed on federally managed lands throughout the Northwest Forest Plan area. There has been no new information or changed circumstances that would alter these conclusions for any of the alternatives.

Great Gray Owl

Background and Affected Environment

Under Alternatives 1 and 3, the great gray owl is included in the Survey and Manage Standards and Guidelines. Under Alternatives 2 and 3, the great gray owl is assumed to be Bureau Tracking for the Oregon/Washington BLM and Forest Service Sensitive in Washington and California. The Survey and Manage Standards and Guidelines and the Agencies' Special Status Species Programs have similar strategies that include both pre-disturbance surveys and management of known sites.

There has been an increase in the known range of the great gray owl since the Northwest Forest Plan Final SEIS. At the time of the Northwest Forest Plan Final SEIS, the great gray owl was documented as nesting in an area along the central Cascade Mountains of Oregon and in a small area southwest of Medford, Oregon. Published data (Hayward and Verner 1994) and the results of surveys indicate that the range is likely much greater. Great gray owls have been documented over much of the Cascade Range in Oregon and Washington, although nesting has not been confirmed in some of these new areas. In addition to increasing the geographic area of known and expected great gray owl nesting, recent information indicates that the great gray owl uses elevations below 3000 feet, the level described in protocols (Huff et al. 1996 and USDA, USDI Species Review Panel 1999). There are currently 114 great gray owl sites (ISMS database). The great gray owl has a spotty distribution throughout the Northwest Forest Plan area and the current population is considered low.

Environmental Consequences

Alternatives 1 and 3 provide sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to its reference distribution (USDA, USDI 2000a, p. 367).

Analyses relevant to Alternative 2 includes the FEMAT rating the great gray owl as having an 83 percent likelihood of Outcome A (habitat sufficient to be stable, well distributed across federally managed lands), a 17 percent likelihood of habitat sufficient to be stable with significant gaps in its historic distribution on federally managed lands, and a 0 percent likelihood of continued existence only in refugia or extirpation from federally managed lands (USDA et al. 1993, p. IV-166). Management specific to the great gray owl included protection of nest sites and foraging habitat and pre-disturbance surveys (similar to the Survey and Manage mitigation measure). The ratings for Alternative 9 reflect these mitigation measures. Alternatives 7 and 8 in the Northwest Forest Plan Final SEIS did not include Protect and Buffer provisions for the great gray owl, provided for less reserve, and generally provided less favorable habitat conditions (USDA, USDI 1994a, pp. 2-56 through 2-59 and 3&4-178). All rated alternatives in the Northwest Forest Plan and FEMAT had a 100 percent likelihood of providing habitat of sufficient quality, distribution, and abundance to allow the great gray owl population to stabilize, but with significant gaps in the historic distribution across federally managed lands (USDA, USDI 1994a, p. 3&4-181). The Agencies' Special Status Species Programs, which provide for surveys and the management of known sites, could only provide added benefit for this species.

In summary, the management efforts under Alternatives 1, 2, and 3 (Survey and Manage mitigation measure or Special Status Species Programs) add protection and may help stabilize or

improve the distribution and populations of the great gray owl. Under all alternatives, the great gray owl would not be at high risk of extirpation.

Late-Successional Mammals

Background and Affected Environment

Additional discussion of background and affected environment is contained in FEMAT, the Northwest Forest Plan Final SEIS, and the Survey and Manage Final SEIS 2000.

The Northwest Forest Plan Final SEIS listed 14 mammal species associated with late-successional forests. Important habitat components for these species were dead standing wood, dead down wood, live old-growth trees, and riparian zones (USDA, USDI 1994a, pp. 3&4-182 through 185).

Management of Riparian Reserves, Congressionally Reserved Areas, and Late-Successional Reserves has occurred as anticipated in the Northwest Forest Plan Final SEIS (USDA et al. 2002). The most common activities in Late-Successional Reserves are silvicultural thinning of young stands (not currently of appropriate age and structural characteristics to be classified as late-successional forest) to accelerate the development of late-successional forest structural and functional conditions, and fuels reduction through prescribed fire in drier forest types. Thinning similar to that in the Late-Successional Reserves has occurred in Riparian Reserves where consistent with Aquatic Conservation Strategy objectives.

Although new information is constantly being gained and old information is being refined, there has been no new information or changed circumstances that would alter the basic scientific understanding of these species or that would alter, for these species, the conclusions of the Northwest Forest Plan Final SEIS.

Environmental Consequences

In addition to the Survey and Manage mitigation measure, the assessments of Option 9 in FEMAT and Alternative 9 in the Northwest Forest Plan Final SEIS did not include seven other mitigations that were added late in the Northwest Forest Plan Final SEIS process including an increase in Riparian Reserves. The increase in the size of Riparian Reserves has implications for improving connectivity for the red tree vole (USDA, USDI 1994a, Appendix J2, p. J2-475).

A conclusion relevant to all alternatives is that Alternative 9 of the Northwest Forest Plan Final SEIS was judged to be among the alternatives most favorable to mammals because it provides the set of allocations and management practices that best produce habitat components for mammals (USDA, USDI 1994a, p. 3&4-183).

The acreage of protected known sites for Survey and Manage species under Alternatives 1 and 3 occurs as scattered, small patches that provide little overall contribution to the maintenance of late-successional forest associated mammal species when compared to the contribution of Congressionally Reserved Areas, Late-Successional Reserves, and Riparian Reserves. If the protection of the known sites was permanent, they could play a role in providing refugia for certain species; however, the protection of these sites varies as new information refines management prescriptions for Survey and Manage species.

The conclusion of the Northwest Forest Plan Final SEIS was that 13 of the 14 species of mammals that were associated with late-successional forest would be stable, well-distributed on federally managed lands throughout the plan area without any anticipated contribution from Survey and

Manage Standards and Guidelines. The exception was the Oregon red tree vole. There is no new information or changed circumstances to alter these conclusions for any of the alternatives.

The relatively small difference in habitat acreage between the alternatives resulting from managed known sites is inconsequential to the maintenance of these species compared to the many millions of acres of late-successional forest habitat contained in the reserves under all alternatives. Because the differences in habitat between the alternatives are inconsequential, they do not represent "gains" or "losses" of habitat essential to Northwest Forest Plan Final SEIS conclusions (USDA, USDI 2000a, p. 371).

Oregon Red Tree Vole (*Arborimus longicaudus*)

Background and Affected Environment

Additional discussion of background and affected environment is contained in FEMAT, the Northwest Forest Plan Final SEIS (including Appendix J2), and the Survey and Manage Final SEIS 2000.

The Oregon red tree vole (referred to herein as the red tree vole) is the only mammal included in the Survey and Manage Standards and Guidelines under Alternative 1. Under Alternatives 2 and 3, the red tree vole is assumed to be Bureau Tracking for the Oregon/Washington BLM. The red tree vole is the most arboreal mammal in the Pacific Northwest (Carey 1996) and is endemic to moist coniferous forests of western Oregon and extreme northwestern California. Its distribution is limited within the Northwest Forest Plan area and is limited throughout its range to coniferous forests. Since the implementation of the Northwest Forest Plan (1994), the known and suspected range of the species has been expanded by approximately 3 million acres in southern Oregon and northern California (USDA, USDI 2000a, p. 375). The red tree vole's geographic range includes approximately 16.3 million acres across all land ownerships. Federally managed lands provide important habitat. More than 70 percent of known sites and 47 percent of the known and suspected range is on federally managed lands (USDA, USDI Species Review Panel 2000). Red tree voles are believed to have limited dispersal capability (USDA, USDI 2000a, p. 377). The role of young forests in the population dynamics of red tree voles is not well understood (USDA, USDI 2000a, p. 378).

In xeric (dry) forests of the Klamath National Forest in northern California and the dry conifer forest surrounding the Rogue and Illinois Valleys in southern Oregon, there is a poor understanding of red tree vole distribution and habitat relationships. Red tree vole habitat becomes more isolated with progressively less connectivity towards the edges of this zone where it intergrades with oak woodlands (USDA, USDI 2000a, p. 384).

A subspecies of the red tree vole (dusky red tree vole (*Phenacomys longicaudus silvicolus*)) was believed to occur in the northern Coast Range of Oregon, primarily on nonfederal lands (USDA, USDI, 1994a, p. 3&4-185). A recent genetic study (Bellinger et al. in prep.) found no clear difference between *P. l. silvicolus* and *P. l. longicaudus*), which brings into question the validity of *P. l. silvicolus* as a subspecies.

That portion of the red tree vole's range located in the Oregon Coast Range north of Highway 20 running between Newport and Corvallis and west of the non-forested Willamette Valley contains limited federally managed land. Federally managed lands in this area are fragmented and geographically isolated, and include portions of the western half of the Salem District BLM and all of the Hebo Ranger District of the Siuslaw National Forest. There are approximately 25 known sites in this portion of the species range, many of them located on private or state lands. Although the northern Coast Range is primarily nonfederal land, some historic red tree vole populations

are known from scattered locations on federally managed lands. Over 93 percent of federally managed lands in the northern Coast Range are Late-Successional Reserve or Late-Successional Reserve-like in their management (USDA, USDI, 2000a, p. 391).

Environmental Consequences

In that portion of the red tree vole's range located on the Klamath National Forest in northern California and the dry conifer forest surrounding the Rogue and Illinois Valleys in southern Oregon, there is insufficient information to determine how any alternative would affect distribution and stability (USDA, USDI 2000a, p. 391).

The red tree vole received a rating for Outcomes A, B, C, and D of 73-25-2-0 by the FEMAT assessment panel (a detailed explanation of these ratings is included early in this chapter). As a result of this rating, the red tree vole failed to pass the screen for additional species analysis in the Northwest Forest Plan Final SEIS (less than 80 percent Outcome A, the likelihood of stable, well distributed across federally managed lands). However, there was a 0 percent likelihood that this species would be extirpated from federally managed lands, a 2 percent likelihood that the habitat would only allow continued species existence in refugia, and a 73 percent likelihood that the population of this species would be stable, well distributed across federally managed lands in the Northwest Forest Plan area (USDA, USDI 1994a, Appendix J2).

The red tree vole failed to pass the screens because of its apparent strong association with old-growth forest, its limited dispersal capabilities, and general concern about the extent to which information is lacking on its distribution, habitat requirements, and population status. The species rating reflected the concern whether provisions of Alternative 9 in the Northwest Forest Plan Final SEIS would adequately provide for connectivity among late-successional patches for dispersal and gene flow. Although evidence cited in the Survey and Manage Final SEIS (USDA, USDI 2000a, p. 386) clearly indicates that red tree voles are most abundant in older forests or in forests with remnant old trees, there is still uncertainty about the role of young forests in the population ecology of red tree voles (USDA, USDI 2000a, p. 378). Wildlife biologists have found many red tree voles and their nests in young stands, including many nests occupied by breeding females (Howell 1926, Clifton 1960, Maser 1965, and ISMS database). It is unclear whether red tree voles in these situations can persist over long periods of time or are ephemeral populations that contribute little to overall population persistence (USDA, USDI 2000a, p. 378).

Mitigation identified in the Northwest Forest Plan Final SEIS Appendix J2 and adopted in its Record of Decision was judged to raise the rating under Outcome A, stable, well-distributed across federally managed lands, above 80 percent (USDA, USDI 1994a, Appendix J2, p. J2-55). This mitigation included the Survey and Manage Standards and Guidelines and the application of Riparian Reserve Scenario 1. There would be a 0 percent likelihood of extirpation from federally managed lands (USDA, USDI 1994a, pp. 3&4-183 and J2-473 through 475). Alternative 1 would allow the species to stabilize in a pattern similar to its reference distribution except in the northern Coast Range where it would stabilize in a pattern different from its reference distribution (USDA, USDI 2000a, pp. 390-391).

Conclusions in the Northwest Forest Plan Final SEIS relevant to Alternatives 2 and 3, include "... the Late-Successional Reserves will support large populations, and connectivity between reserves will be provided by Riparian Reserves, and the additional late-successional patches in the matrix" (USDA, USDI 1994a, Appendix J2, pp. J2-474 through 475). Implementation of Riparian Reserve Scenario 1, which was added to Alternative 9 in the Northwest Forest Plan Record of Decision, was identified as "a key standard and guideline addition for ... red tree vole" (USDA, USDI 1994a, p. 3&4-183). There would be a 0 percent likelihood of extirpation from federally managed lands, a 2 percent likelihood that the species would be restricted to refugia, and a 73 percent likelihood that the population of this species would be stable, well-distributed across federally managed land in the Northwest Forest Plan area (USDA, USDI 1994a, Table 3&4-30, p. 3&4-184; and Appendix J2, pp. J2-473 through 475).

Cumulative effects assessment in the Northwest Forest Plan Final SEIS disclosed that federally managed lands would likely provide for large, well-distributed populations of the species, except possibly in the northern Coast Range of Oregon (USDA, USDI, 1994a, Appendix J2, p. J2-474). Approximately 93 percent of federally managed lands in the northern Coast Range are in Late-Successional Reserves or Late-Successional Reserve-like in their management (USDA, USDI, 2000a, p. 391). Because there are so few known sites in this area, the loss of sites on federally managed lands in the northern Coast Range of Oregon would result in a risk of extirpation of the species in this portion of its range. There are currently no known sites on federally managed lands in this area (ISMS database).

Summary and Possible Mitigation

Under Alternative 1, the Survey and Manage Standards and Guidelines and Riparian Reserve Scenario 1 would raise the red tree vole rating to above 80 percent likelihood of sufficient habitat to provide for stable, well-distributed populations across federally managed land and a 0 percent likelihood of extirpation (USDA, USDI 1994a, Appendix J2, p. J2-475). Alternative 1 would allow the species to stabilize in a pattern similar to its reference distribution except in the northern Coast Range where it would stabilize in a pattern different from its reference distribution (USDA, USDI 2000a, pp. 390-391).

Under Alternatives 2 and 3, with the inclusion of Riparian Reserve Scenario 1, the rating for the red tree vole was improved by an undetermined amount above 73 percent likelihood of sufficient habitat to provide for stable, well-distributed populations across federally managed lands and a 0 percent likelihood of extirpation in the Northwest Forest Plan area.

In that portion of the red tree vole's range located on the Klamath National Forest in northern California and the dry conifer forest surrounding the Rogue and Illinois Valleys in southern Oregon, there is insufficient information to determine how any alternative would affect distribution and stability (USDA, USDI 2000a, p. 391).

Under Alternatives 1, 2, and 3, the red tree vole would not be at high risk of range-wide extirpation within the Northwest Forest Plan area. Under Alternatives 2 and 3, the red tree vole would be at risk of extirpation in that portion of the species range located in the northern Coast Range of Oregon.

Possible mitigation under Alternatives 2 and 3 includes pre-project clearances and management of known sites of the red tree vole that are not located in existing reserves in that portion of the Oregon Coast Range north of Highway 20 running between Newport and Corvallis and west of the non-forested Willamette Valley. This mitigation would eliminate the high risk of extirpation of the red tree vole in this area of the Oregon Coast Range. These mitigations could be implemented consistent with the Agencies' Special Status Species Programs. See Chapter 2 for a detailed description of these programs.

Species Associated with Early-Successional Forest

Background and Affected Environment

The Northwest Forest Plan was developed to address federal land management related to late-successional forest associated species. Despite this emphasis, the Northwest Forest Plan Final SEIS, the Survey and Manage Final SEIS 2000, and this SEIS examined the expected effects of the alternatives on early-successional forest associated species. Early-successional forest associated species, as a group, are generally widespread and occur throughout the Northwest Forest Plan area. Individual species may be distributed in a small geographic range, and occur in

a more limited area within that general geographic range. These species are adapted to a variety of early-seral habitats. These species are assumed stable within the planning area (USDA, USDI 2000a, p. 396).

The assumed availability on a landscape scale of early-successional habitat is unlikely to substantially differ from that occurring under historic natural disturbance processes. The Northwest Forest Plan was found acceptable for sustaining adequate populations of species dependent upon young-forest habitat (USDA, USDI 2000a, p. 396).

Environmental Consequences

The primary sources of early-successional habitat are timber harvest and natural disturbance processes. The Northwest Forest Plan anticipated an annual harvest level of 958 million board feet (MMBF) of timber. Actual harvest levels have been less (see Timber Harvest section). Under Alternatives 2 and 3, known sites for some Survey and Manage species would continue to be managed through the Special Status Species Programs.

Relevant to Alternatives 1 and 3, the Survey and Manage Final SEIS 2000 concluded that Survey and Manage Standards and Guidelines would not result in significant changes to the abundance and distribution of species associated with early-successional habitat that were anticipated in the Northwest Forest Plan SEIS. This is due to the large extent of early-successional habitat currently available, and the reasonable expectation that federally managed and nonfederal lands will continue to be harvested and natural disturbances will continue throughout the Northwest Forest Plan area (USDA, USDI 2000a, p. 397). Because these assumptions apply to all alternatives, under all alternatives, early-successional species are expected to remain stable and distributed in a pattern similar to their historic distribution within the Northwest Forest Plan area.

Threatened and Endangered Species

This section discusses the expected effects to terrestrial and inland aquatic species listed as threatened, endangered, or proposed for listing under the Endangered Species Act of 1973, as amended. See the Aquatic Ecosystem section for a discussion of fish species in the Northwest Forest Plan area listed as threatened or endangered. Refer to Appendix 5 for the Forest Service' draft Biological Evaluation which includes effects to species currently included in the Sensitive Species Programs in Regions 5 (California) and 6 (Washington and Oregon).

Effects to listed species associated with late-successional and old-growth forests in the Northwest Forest Plan area (i.e. the action area) are discussed in detail.

Northern Spotted Owl (*Strix occidentalis caurina*)

Background and Affected Environment

Management of the northern spotted owl and its habitat on federally managed lands was an important consideration in the design of the Northwest Forest Plan. This species received extensive attention in the Northwest Forest Plan Final SEIS and its supporting documents. The Biological Opinion for the Draft of the Northwest Forest Plan concluded:

> "*..the adoption of Alternative 9, as modified, is not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of any designated critical habitat for those species. The late-successional and riparian reserve*

features of Alternative 9 are particularly important contributions to the conservation of the spotted owl and marbled murrelet" (USDA, USDI 1994a, p. 3, Appendix G).

The Survey and Manage mitigation measure was not a component of the Northwest Forest Plan Draft SEIS. The addition of the Survey and Manage mitigation measure would have an insignificant effect on the maintenance of spotted owl populations (USDA, USDI 2000a, p. 398). This was due to the small scale and isolated nature of the resultant late-successional and old-growth forest areas outside of reserves.

The Northwest Forest Plan concluded that the anticipated rate of timber harvest in Matrix and Adaptive Management Areas would occur in a manner that would allow the habitat to regrow and spotted owl populations to stabilize in the Late-Successional Reserves and Congressionally Reserved Areas.

The Survey and Manage Final SEIS 2000 concluded that neither the original basis for the assessment nor the conclusion of the effects to the northern spotted owl as presented in the Northwest Forest Plan would be affected by the Survey and Manage Standards and Guidelines.

Environmental Consequences

Reserves protect about 80 percent of the federally managed lands within the Northwest Forest Plan area. Eighty-six percent of the remaining late-successional and old-growth forests are in these reserves. The remaining 14 percent is available for regularly scheduled timber harvest. The Northwest Forest Plan projected that less than 2.5 percent of the late-successional forest would be harvested per decade. Actual harvest has been well below that rate. The reduced rate of harvest is due primarily to greater than expected riparian reserve coverage, the effects of the Survey and Manage mitigation measure, and legal challenges. Harvest of late-successional forest under any alternative would not exceed the rate anticipated in the Northwest Forest Plan Final SEIS.

Removing the Survey and Manage Standards and Guidelines could release for timber harvest up to 26,000 acres that is currently protected in known sites. The effect of this change is anticipated to have little effect on the northern spotted owl due to the small size and dispersed nature of the known sites. None of the alternatives would exceed the scope of impacts originally consulted upon in 1994.

Marbled Murrelet (*Brachyramphus marmorata*)

Background and Affected Environment

Management of the marbled murrelet and its habitat on federally managed lands was an important consideration in the design of the Northwest Forest Plan. This species received extensive attention in the Northwest Forest Plan Final SEIS and its supporting documents. The Biological Opinion for the Draft of the Northwest Forest Plan concluded:

"*…the adoption of Alternative 9, as modified, is not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of any designated critical habitat for those species. The late-successional and riparian reserve features of Alternative 9 are particularly important contributions to the conservation of the spotted owl and marbled murrelet*" (USDA, USDI 1994a, p. 3, Appendix G).

The management strategy for marbled murrelets in the Northwest Forest Plan includes two primary components: (1) protection and development of marbled murrelet nesting habitat inside the large reserves near the coast, and (2) retention of all current and future known marbled murrelet nest sites in all land allocations.

Environmental Consequences

Under Alternative 1, the level of protection for currently occupied marbled murrelet habitat would not be changed; all known and future nest sites would be protected.

Under Alternatives 2 and 3, small areas of late-successional forest that are currently protected as known sites of Survey and Manage species would be released for timber harvest. The known sites of Survey and Manage species being managed are generally only a few acres in size and are not known to be occupied by marbled murrelets. The Northwest Forest Plan projected that less than 2.5 percent of the remaining late-successional forest would be harvested per decade. Actual harvest has been well below that rate. The reduced rate of harvest is due primarily to greater than expected riparian reserve coverage, the effects of the Survey and Manage mitigation measure, and legal challenges. Harvest of late-successional forest under all alternatives would not exceed the rate anticipated in the Biological Opinion for the Northwest Forest Plan (USDA, USDI 1994a, Appendix G). These levels of impacts to marbled murrelet habitat are not expected to exceed those levels consulted upon in 1994.

Bald Eagle (*Halieatus leucocephalus*)

Background and Affected Environment

The Agencies survey extensively for bald eagles. Management of the bald eagle includes preparation of site-specific management plans and providing protection zones and management areas, as needed, to the species and its habitat.

Environmental Consequences

The requirements to conduct specific surveys and develop site management plans for bald eagles do not change between the alternatives. Consultation on the Northwest Forest Plan concluded "… that the adoption of Alternative 9, as modified, is not likely to jeopardize the continued existence of any listed species." Therefore, there is no difference between the alternatives. None of the alternatives would exceed the scope of impacts originally consulted upon in 1994 (USDA, USDI 1994a, Appendix G).

Canada Lynx (*Lynx canadensis*)

Background and Affected Environment

The Canada lynx was listed by the U.S. Fish and Wildlife Service as a threatened species within the conterminous United States, effective April 24, 2000. Concurrent with the listing process, a national interagency Lynx Conservation Assessment and Strategy was developed to provide a consistent and effective approach to conservation of Canada lynx on federally managed land in the conterminous United States. This conservation agreement was entered into by the Forest Service, Bureau of Land Management, and the U.S. Fish and Wildlife Service. The Forest Service and

Bureau of Land Management agreed to consider conservation measures in the Lynx Conservation Assessment and Strategy when designing and implementing activities that might affect lynx.

Environmental Consequences

The Survey and Manage mitigation measure plays no role in the protection of the Canada lynx; therefore, there would be no environmental consequences to the Canada lynx under any of the alternatives. Each agency has agreed not to conduct activities that are likely to adversely affect the lynx, unless land and resource management plans undergo additional NEPA and ESA review.

Gray Wolf (*Canis lupus*)

Background and Affected Environment

The range of the gray wolf includes portions of the Northwest Forest Plan area, including the northern Cascade Range in Washington. Gray wolves are not closely associated with late-successional forest, but use a variety of open and forested habitat that support deer, elk, and other species that are their primary prey, as well as areas supporting small mammal populations.

Environmental Consequences

All alternatives would have nearly identical effects on gray wolf habitat. Because gray wolves are not dependent on late-successional forest, loss of the small, isolated patches of late-successional forest that would be protected under the Survey and Manage Standards and Guidelines would have no effect on habitat for this species. None of the alternatives would affect the original basis for the assessment of the effects and conclusions in the Northwest Forest Plan Final SEIS.

Grizzly Bear (*Ursus arctos*)

Background and Affected Environment

The range of the threatened grizzly bear includes portions of the Northwest Forest Plan area, including the National Forests of the Cascade Range in Washington. While grizzly bears are not closely associated with late-successional forests, they use a variety of habitat, including forested areas for hiding and cover.

Environmental Consequences

All alternatives would have nearly identical effects on grizzly bear habitat. Because grizzly bears are not dependent on late-successional forest, the small, isolated patches of late-successional forest that would be protected under the Survey and Manage Standards and Guidelines would have no effect on habitat for this species. None of the alternatives would affect the original basis for the assessment of the effects and conclusions in the Northwest Forest Plan Final SEIS.

Other Species

The following terrestrial or inland-aquatic listed species occur within the Northwest Forest Plan area, but are not associated with late-successional and old-growth forests. The Survey and Manage Standards and Guidelines were developed to address concerns for species associated with late-successional forest. Any habitat protected by the Survey and Manage Standards and Guidelines is likely to be late-successional conifer forest. Therefore, any changes to the Survey and Manage Standards and Guidelines are not expected to affect these species or the conclusions of the Northwest Forest Plan Final SEIS.

Vascular Plants

Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*
MacDonald's rockcress	*Arabis macdonaldiana*
Marsh sandwort	*Arenaria paludicola*
Applegate's milkvetch	*Astragalus applegatei*
Clara Hunt's milkvetch	*Astragalus clarianus*
Tiburon paintbrush	*Castilleja affinis* ssp. *neglecta*
Golden Indian paintbrush	*Castilleja levisecta*
Howell's spineflower	*Chorizanthe howellii*
Sonoma spineflower	*Chorizanthe valida*
Baker's larkspur	*Delphinium bakeri*
Yellow larkspur	*Delphinium luteum*
Willamette daisy	*Erigeron decumbens* var. *decumbens*
Menzies' wallflower	*Erysimum menziesii*
Gentner's mission-bells	*Fritillaria gentneri*
Marin dwarf-flax	*Hesperolinon congestum*
Showy stickweed	*Horkelia venusta*
Water howellia	*Howellia aquatilis*
Burke's goldfields	*Lasthenia burkei*
Contra costa goldfields	*Lasthenia cojugens*
Beach layia	*Layia carnosa*
Western lily	*Lilium ocidentale*
Large-flowered wooly meadowfoam	*Limnanthes floccose* spp. *grandiflora*
Bradshaw's lomatium	*Lomatium bradshawii*
Agate desert-parsley	*Lomatium cookii*
Kincaid's lupine	*Lupinus sulphereus* var. *kincaidii*
Pt. Reyes clover lupine	*Lupinus tidestromii* var. *layneae*
Tidestrom's clover lupine	*Lupinus tidestromii* var. *tidestromii*
Many-flowered navarretia	*Navarretia leucocephala* ssp. *plieantha*
Slender Orcutt grass	*Orcuttia tenuis*
Yreka phlox	*Phlox hirsuta*
Hairy (rough) popcorn flower	*Plagiobothrys hirtus*
Calistoga allocarya	*Plagiobothrys strictus*
Napa bluegrass	*Poa napensis*
Nelson's checkermallow	*Sidalcea nelsoniana*
Wenatchee Mountain checkermallow	*Sidalcea oregana* var. *calva*
Kenwood Marsh checkermallow	*Sidalcea oregana* var. *valida*
Ladies'-tresses	*Spiranthes diluvialus*
Kneeland Prairie penny-cress	*Thlaspi californicum* (*montanum* var. *californicum*)
Showy Indian clover	*Trifolium amoenum*

Invertebrates

Conservancy fairy shrimp	*Branchinecta conservatio*
Vernal pool fairy shrimp	*Branchinecta lynchi*
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*
Mission blue butterfly	*Icaricia icarioides missionensis*
Fender's blue butterfly	*Icaricia icarioides fenderi*

San Bruno elfin butterfly	*Incisalia mossii bayensis*
Vernal pool tadpole shrimp	*Lepidurus packardi*
Lotis blue butterfly	*Lycaeides argyrognomon lotis*
Shasta (placid) crayfish	*Pacifastacus fortis*
Callippe silverspot butterfly	*Speyeria callippe callippe*
Behren's silverspot butterfly	*Speyeria zerene behrensii*
Oregon silverspot butterfly	*Speyeria zerene hippolyta*
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*
California freshwater shrimp	*Syncaris pacifica*

Fish

Tidewater goby	*Eucyclogobius newberryi*
Delta smelt	*Hypomesus transpacificus*
Oregon chub	*Oregonichthys* (*Hybopsis*) *crameri*

Birds

Western snowy plover (coastal populations)	*Charadrius alexandrinus nivosus*
Brown pelican	*Pelcanus occidentalis*
California clapper rail	*Rallus longirostris obsoletus*

Mammals

Point Arena mountain beaver	*Aplodontia rufa nigra*
Steller's (northern) sea lion	*Eumetopias jubatus*
Columbian white-tailed deer	*Odocoileus virginianus leucurus*
Salt marsh harvest mouse	*Reithrodontomys raviventris*

The Agencies survey for listed and proposed plant species in the vicinity of proposed projects. These surveys are designed to have a high likelihood of locating populations of such plants irrespective of whether surveys are also done for Survey and Manage species. Since surveys for listed or proposed plant species will discover and subsequently protect these species with or without the Survey and Manage mitigation measure, there would be no difference between the alternatives.

All projects proposed on BLM or Forest Service administered lands must meet the Aquatic Conservation Strategy objectives of the Northwest Forest Plan. As proposed projects are designed and analyzed for effects to listed fish, needs of the fish species and habitat elements required to meet Aquatic Conservation Strategy objectives will be identified. Alternatives 2 and 3 would not alter this assessment process; therefore, there would be no change in effect as a result of the removal or modification of the Survey and Manage Standards and Guidelines when compared to Alternative 1.

The changes in the Survey and Manage Standards and Guidelines under Alternatives 2 and 3 would not affect the riparian-associated habitat of the California red-legged frog (*Rana aurora draytonii*). Although the most important habitat for red-legged frog is aquatic and riparian, this species is known to sometimes move through moist forest habitat during dispersal. Within the Northwest Forest Plan area, the listed range of the species may include some portions of the Mendocino and Shasta-Trinity National Forests, but due to the poor potential quality of the habitat (lack of narrow, incised channels and pools, dry chaparral/knobcone pine habitat, etc.), and elevation bands that the species is most likely to occur in, the alternatives being considered here are expected to have little or no effect on the species (Bratch 2000, pers. comm.). Few historical sightings for this species have been recorded in its limited potential range in the Northwest Forest Plan area.

Under all alternatives, the Agencies would survey for listed species in the vicinity of proposed projects. These surveys are designed to have a high likelihood of locating populations of red-legged frogs irrespective of whether surveys are also done for Survey and Manage species. In

addition, the species habitat will be provided a high level of protection through implementation of Aquatic Conservation Strategy objectives and the reserve land allocations. Therefore, there would be no environmental consequences to this species under any of the alternatives.

Costs of Management

In the 2000 Survey and Manage Final SEIS, it was estimated that the entire Survey and Manage program would cost approximately $28.6 million per year (p. 417, Table 3&4-6). This total includes $9.8 million for strategic surveys and other regional level tasks such as the maintenance of databases and the development of management recommendations. The total also includes $18.8 million for pre-disturbance surveys that would occur prior to activities such as timber sales ($8.2 million) and prescribed burning ($10.3 million). These estimates were based on predicted levels of timber sales, prescribed burning projects, and other habitat-disturbing activities.

Since 2000, the actual levels of habitat-disturbing activities have fallen short of that anticipated. As a result, the actual amount spent in Fiscal Year 2002 for the Survey and Manage program was $16 million.

Comparison of Alternatives

These cost estimates are presented for comparative purposes only. Actual implementation costs will vary.

Alternative 1

Alternative 1 would cost approximately $25.9 million per year to implement. This cost is less than predicted in 2000 because actual program management and strategic survey costs from Fiscal Year 2003 were used. These costs have had a downward trend over the past 3 years. This estimated cost also reflects a savings accomplished by the removal of some species from Survey and Manage and elimination of requirements to conduct pre-disturbance surveys for some species through the 2001 and 2002 Annual Species Reviews. There were increased costs in pre-disturbance surveys compared to the 2000 Survey and Manage Final SEIS because acres thinned through the timber program are no longer considered complete fuel reduction projects adding 50,000 acres per year to the fuel treatment program. The total cost of Alternative 1 includes $6.0 million for pre-disturbance surveys for timber; $13.3 million for pre-disturbance surveys for fuel treatment; $0.3 million for pre-disturbance surveys for other activities; $6.3 million for Strategic Surveys, program management, training, data management, and other costs. Pre-disturbance surveys would cost approximately $73.18 per acre.

The Survey and Manage Final SEIS (USDA, USDI 2000a, p. 419) estimated that long-term (6-10 years) costs would decline by approximately 41 percent as strategic surveys are completed and recommendations are made for management of high-priority sites. It is assumed that this trend would apply to Alternative 1.

Alternative 2

Alternative 2 would cost approximately $7.5 million per year to implement. The total cost of Alternative 2 includes $1.7 million for pre-disturbance surveys for timber; $4.9 million for pre-disturbance surveys for fuel treatments; $0.2 million for pre-disturbance surveys for other activities; $0.7 million for general surveys, program management, training, data management and other costs. Pre-disturbance surveys would cost approximately $54.78 per acre. As with Alternative 1, costs may decline over time as information is gained on the species in the Special Status Species Programs. It is estimated that 5 percent savings would accrue over time as

knowledge is gained about species.

Alternative 2 differs from Alternative 1 in several key ways that affect cost.

- Reduced pre-disturbance surveys
  - › Sixteen species that would have pre-disturbance surveys with Alternative 1 would not be surveyed under Alternative 2 because they are assumed not to be included in the Agencies' Special Status Species Programs. This includes 1 lichen, 1 vascular plant, the red tree vole, and 13 mollusks.
  - › Many other species would only be surveyed in a portion of their range under Alternative 2. For example, a species may be added to the sensitive species list in BLM managed lands in California but not on nearby National Forest System lands.
  - › It is assumed, for the purpose of cost analysis, that local land managers would not survey in young stands for species that are thought to be dependent on late-successional habitats. For timber projects, this amounts to an estimated reduction of 50,000 acres of surveys per year. For fuel treatment projects, it is estimated that one-half of all projects would not need pre-disturbance surveys. These reductions are in comparison to Alternative 1.

- Increased pre-disturbance surveys
  - › There are 67 species that would be added to the Special Status Species Programs under Alternative 2 that do not currently require pre-disturbance surveys (because they are in Categories B, D, E, or F). With Alternative 2, local land managers would decide what level of survey, if any, to apply to these species. It is assumed, for the purpose of cost analysis, that there would be no increases in pre-disturbance surveys because the same logic used with Alternative 1 to determine that pre-disturbance surveys were not needed, would be used by local managers. Similarly, where species have split ranges under Alternative 1 that limit surveys to only portions of their range, it is assumed that the same logic would apply to Alternative 2.

- Reduced strategic surveys
  - › With Alternative 2, there would be general surveys where needed to determine species distribution and to identify trends but the cost of this would be far less than strategic surveys under Alternative 1.
  - › With Alternative 2, arthropod and red tree vole studies would be eliminated since they are not included in the Special Status Species Programs.

- Miscellaneous costs and overhead
  - › It is assumed that other program management costs such as maintaining databases, updating survey protocols and field guides, and overhead would occur with Alternative 2, but at a reduced level when compared to Alternative 1. This reduction would be a result of elimination of the large overhead in place to administer the Survey and Manage program, while existing overhead for the Special Status Species Programs would suffice with some additions to accommodate increased workload. Some costs might shift from regional to local levels. For example, at local units, Environmental Assessments and Biological Evaluations would require additional documentation to incorporate the species added to Special Status Species Programs.

Measures could be used to mitigate the adverse environmental impacts for species that would be at a high risk of extirpation in the Northwest Forest Plan area or a portion of their range in the Northwest Forest Plan area under Alternative 2. Mitigation of these effects under Alternative 2 could include management of known sites not protected by reserves or the Agencies' Special Status Species Programs. In addition, mitigation for some of these species could include pre-project clearances. These mitigations would eliminate the high risk of extirpation. The cost of possible mitigation under Alternative 2 for species would be $0.6 million.

Alternative 3

Alternative 3 would cost approximately $11.8 million per year to implement. The total cost of Alternative 3 includes $1.9 million for pre-disturbance surveys for timber; $5.7 million for pre-disturbance surveys for fuel treatments; $0.2 million for pre-disturbance surveys for other activities; $4.0 million for general surveys, program management, training, data management, and other costs. Pre-disturbance surveys would cost approximately $63.23 per acre.

Alternative 3 differs from Alternative 1 in several key ways that affect cost.

- Reduced pre-disturbance surveys
  - › Pre-disturbance surveys would not be conducted in young stands. For timber projects, this amounts to an estimated reduction of 50,000 acres of surveys per year. For fuel treatment projects, it is estimated that one-half of all projects would not need pre-disturbance surveys.
  - › Six Category C species would be eliminated from the Survey and Manage mitigation measure; four of these species would continue to be surveyed under the Agencies' Special Status Species Programs. The primary cost savings would be from eliminating surveys for red tree voles.

- Reduced strategic survey costs
  - › The elimination of Categories C, D and F species would result in a savings of $2.3 million per year compared to Alternative 1. Under Alternative 1, this amount would be spent on surveys and other studies to help define high-priority sites, rewrite Management Recommendations, and to answer questions about the species role in ecosystems.
  - › As with Alternative 1, most strategic surveys would eventually be completed. In the long term, costs for strategic surveys under Alternative 3 would decline to approximately one tenth the current level.

Measures could be used to mitigate the adverse environmental impacts for species that would be at a high risk of extirpation in the Northwest Forest Plan area or a portion of their range in the Northwest Forest Plan area under Alternative 3. Mitigation of these effects under Alternative 3 could include management of known sites not protected by reserves or the Agencies' Special Status Species Programs. In addition, mitigation for some of these species could include pre-project clearances. These mitigations would eliminate the high risk of extirpation.

The cost of possible mitigation under Alternative 3 for species at high risk of extirpation in the Northwest Forest Plan area is negligible.

Table 3&4-5. Annual Cost (In millions of dollars).

Cost Element (includes overhead)	Alternative 1	Alternative 2	Alternative 3
Pre-disturbance surveys for Timber	6.0	1.7	1.9
Pre-disturbance surveys for Fuel Treatments	13.3	4.9	5.7
Pre-disturbance surveys for Other	0.3	0.2	0.2
Pre-disturbance surveys total	19.6	6.8	7.8
Strategic Surveys / General Surveys Program Management / Training / Data Management / Other Costs	6.3	0.7	4.0
Total Annual Cost (short term)	25.9	7.5	11.8
Total Annual Cost with Mitigation (short term)		8.1	11.8
Long-term Annual Cost (10 years)	15.3	7.1	9.2
Long-term Annual Cost with mitigation (10 years)		7.7	9.2

Timber Harvest

Background and Affected Environment

Each alternative would directly affect the level of timber available for harvest from lands administered by the Forest Service and BLM within the Northwest Forest Plan area. The purpose of this section is to display the effects of the alternatives on the Probable Sale Quantity (PSQ) at the Northwest Forest Plan scale (24.5 million acres) to provide a relative comparison between the alternatives. Effects at the administrative unit would vary from this regional-level analysis. This analysis is not intended to have the precision necessary for re-declaring the PSQ for the National Forests and BLM Districts. Further, the alternatives in this SEIS do not authorize timber sales or other habitat-disturbing activities. The decision to harvest timber is made in site-specific, project-level decisions that implement land and resource management plans of administrative units.

Changes in PSQ from 1994 to Present

As noted in the 1994 Northwest Forest Plan Final SEIS, the PSQ is based only on those lands considered suitable for programmed, long-term, sustainable timber harvest. These lands are only in the Matrix and Adaptive Management Area land allocations. Riparian, Late-Successional, and other reserve allocations do not contribute to PSQ.

The Northwest Forest Plan Final SEIS estimated the PSQ at 958 million board feet (MMBF), plus an additional 10 percent volume estimated in "other wood" (cull, submerchantable, firewood, and other products) for a total of 1.1 billion board feet (USDA, USDI, 1994a, pp. 3&4-266 and 268).

The 2000 Survey and Manage Final SEIS describes the changes in PSQ from 958 MMBF at the onset of the plan to the year 2000 level of 811 MMBF. In 2001, the Oregon Washington BLM State Director re-declared the Coos Bay and Eugene Districts PSQ (6 MMBF reduction) in response to the transfer of lands to the Coquille Tribe and additional protection for late-successional forest as required by the Northwest Forest Plan. The current combined PSQ for the BLM and Forest Service is 805 MMBF (current baseline PSQ for the Northwest Forest Plan). Management of known sites for Survey and Manage species identified since the beginning of the Northwest Forest Plan has not been incorporated into the PSQ.

Relationship of PSQ and Late-Successional Forest

Of the 24.5 million acres in the Northwest Forest Plan area, approximately 8 million are late-successional forest. Of the 8 million acres of existing late-successional forest 86 percent is being managed in the reserve land allocations: Congressionally Reserved, Late-Successional Reserves, Riparian Reserves, and/or Administratively Withdrawn Areas. Fourteen percent of the existing late-successional forest, 1.1 million acres, is within the Matrix and Adaptive Management Area land allocations. These 1.1 million acres of late-successional forest are the primary source for harvest in support of the PSQ.

On most administrative units, the PSQ is heavily dependent on harvesting late-successional forest for 3 to 5 more decades until early-successional stands begin to mature and become available for harvest. Because of this dependence, harvest schedules indicate about 90 percent (709 MMBF annually) of PSQ over the next decade is dependent on harvest of late-successional forest. This situation was reflected in modeling PSQ for the Northwest Forest Plan as:

> "*Most of the harvest in Option 9 [the selected alternative]...over the next decade will come from late-successional (over 80 years old)...While Option 9 may reserve sizeable amount of late-successional forest on federal land, it does not escape the historic dependence on late-successional forest and old growth as the source of harvest volume..*." (Johnson et al. 1993, p. 22).

Since a majority of sites are assumed to be in late-successional forests, managing species sites within the Matrix and Adaptive Management Areas has the effect of reducing the amount of late-successional forest that is available for harvest. This reduction in the amount of late-successional forest available for harvest has a direct and calculable effect on PSQ.

Reductions to the 1.1 million acres of late-successional forest available for harvest through management of known sites are assumed to have a direct, proportional effect to the 709 MMBF annual portion of the PSQ dependent on late-successional forests. For purposes of this analysis, the remaining 96 million board feet which comes from early-successional forests is assumed to be unaffected by the management of known sites, and is held constant across all alternatives.

Although known sites affect harvest of early-successional forest for some species, the ISMS database used for this analysis does not distinguish between early and late-successional forest at this time. Since Survey and Manage species are, by definition, closely associated with late-successional and old-growth forest, the calculated acreage effects are all assumed to occur on late-successional forest in this PSQ analysis.

The Survey and Manage Final SEIS 2000 provided a detailed explanation on the shift in late-successional forest between the Reserves and Matrix/Adaptive Management Area as a result of the reductions in the PSQ since the beginning of the Northwest Forest Plan. The assumptions for late-successional forest acreage available for harvest are the same as in the Survey and Manage Final SEIS 2000. The 6 MMBF reduction in PSQ since 2000 has not been incorporated into the assumptions for lands available for harvest because of the relatively minor nature of the change.

Differences in Data Since 2000 Survey and Manage Final SEIS

For purposes of this analysis, the ISMS data is assumed to reflect survey results up though calendar year 2001.

In the 2000 Survey and Manage Final SEIS, Geographic Information System (GIS) data was not available for the red tree vole and great gray owl and estimations were made without GIS analysis. GIS data is now available for these two species and was used in this analysis.

Methodology Used in Analysis of PSQ

Estimating the effects to PSQ is dependent on being able to determine the number of acres of late-successional forest that will ultimately be managed as known sites for Survey and Manage species. The Agencies have now had 4 years experience conducting pre-disturbance surveys for most of the species requiring such surveys. The last 4 years of survey data which has been entered into the ISMS database is the basis for estimating the current acreage of known sites and species detection rates.

In the 2000 Survey and Manage Final SEIS and this analysis, it is assumed that it will take 25 years to survey the 1.1 million acres of late-successional forest in the Matrix and Adaptive Management Areas based on input from the field units. For most species, predicting the eventual number of sites that might affect PSQ involves projecting the current known sites detection rate ahead for 25 years. Since the alternatives provide for removing species from Survey and Manage and/or Special Status Species Programs, some of the more numerous species were projected for a shorter period of time. Although the alternatives provide for adding species to Survey and Manage and Special Status Species Programs no estimation of effects was attempted for adding new species.

The average number of acres managed at each site varies by taxa group and by species within the taxa groups, according to habitat requirements described in Management Recommendations for each species or taxa group. The same average number of acres managed at each site, for particular species, was held as a constant for the alternatives. GIS was used to apply buffers to each of the

species sites which have been identified within the Matrix and Adaptive Management Areas to calculate the total acreage of current known sites. Additional adjustments were made to account for acreage which would become inoperable for harvest, sites within riparian reserves, and additional sites expected to be found with strategic surveys (Alternatives 1 and 3).

Timber Sale Offerings

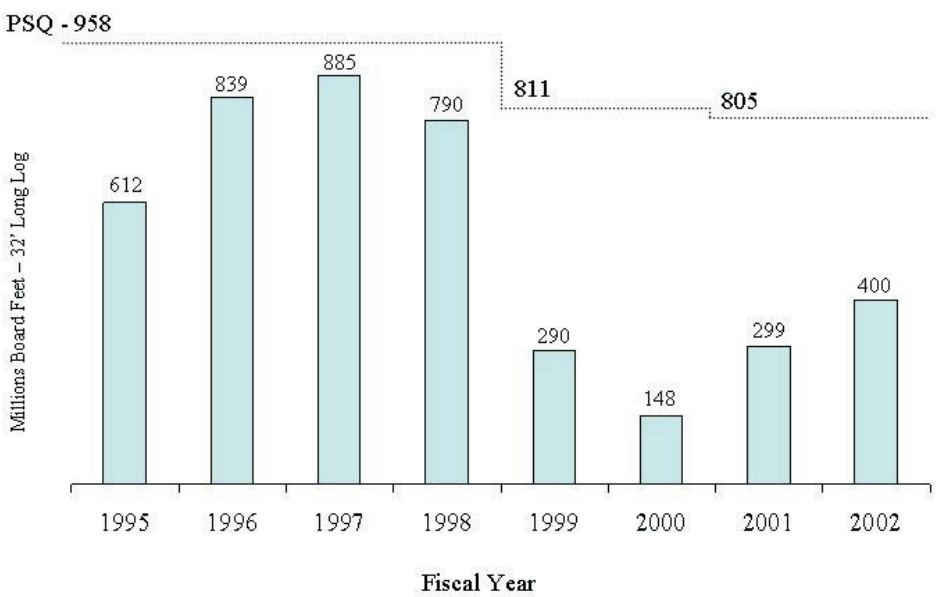
The Agencies' annual timber sale offerings are shown in Figure 3&4-4. The Agencies' harvest targets were 60 and 80 percent of PSQ during the start-up years of 1995 and 1996, respectively. Shortfalls in sales offered since 1998 are related to the implementation of the Survey and Manage Standards and Guidelines and biological opinions related to certain harvests in watersheds with threatened or endangered anadromous fish (ESA consultation issues associated with the Pacific Coast Federation of Fishermen's Associations et al. v. National Marine Fisheries Service lawsuits (commonly referred to as the PCFFA ruling)) and protest /appeals on individual sales.

Since the beginning of the Northwest Forest Plan, the Agencies have offered timber sales at 60 percent of the PSQ on average. Prior to the litigation on the Survey and Manage Standards and Guidelines and the PCFFA ruling (fiscal years 1995-1998), the Agencies had offered 82 percent of the PSQ. Considering the start-up period anticipated by the Northwest Forest Plan, the Agencies were close to meeting the timber sale objectives during that timeframe. Since 1999, the Agencies offerings have been reduced to 35 percent of the PSQ.

Environmental Consequences

The effect on PSQ is a direct result of the number of acres being managed within the Matrix and Adaptive Management Area allocations for the species considered in the alternatives. These areas are not reserves; however, they are unavailable for harvest for several decades. Figure 3&4-5

Figure 3&4-4. Annual Timber Sale Offerings in Relation to PSQ.



reflects the estimated acreage associated with the species under the alternatives which have been identified in the ISMS database, within the Matrix and Adaptive Management Area allocation, up to the present time. The data in ISMS prior to 1998 reflects the number of sites identified prior to the implementation of pre-disturbance surveys. The acreage of sites identified after 1998 reflect sites identified within ISMS with pre-disturbance surveys being conducted. This illustrates the relative acreage of sites in ISMS associated with the species under the alternatives, as well as the rates of detection used in the projections of effects.

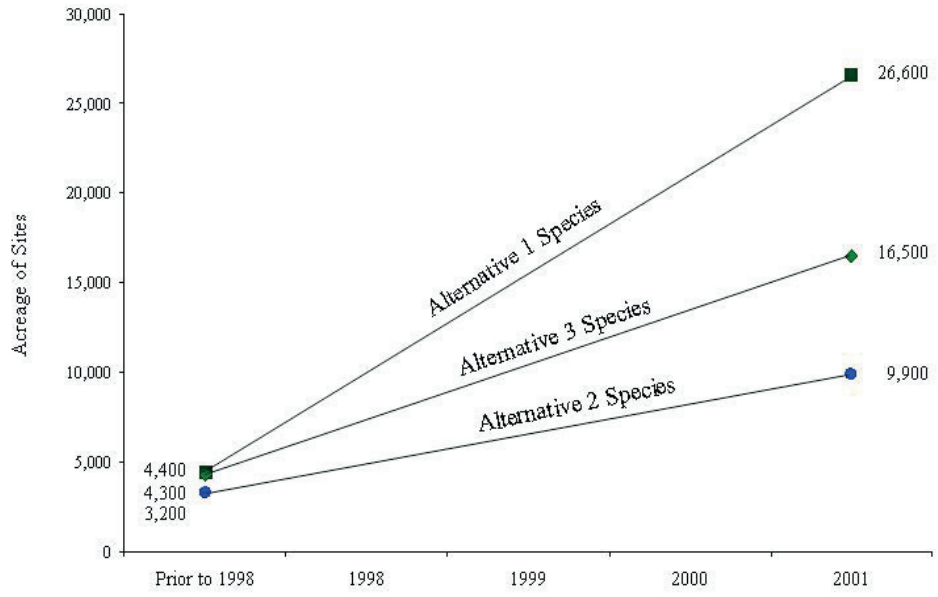
Additional Constraints on Timber Sale Offerings and Estimating Effects on PSQ

The data within ISMS and existing acreage of sites illustrated in Figure 3&4-5 does not convey the full constraints on the implementation of timber sales for the management of known sites within the Matrix and Adaptive Management Areas.

In recent years, the PCFFA ruling has constrained timber sales in areas with ESA-listed anadromous fish species to those which do not require formal consultation. As a result there has been additional emphasis on thinning of younger stands while some road construction, regeneration harvest, and density management silvicultural practices, in areas with listed fish, have been precluded.

With the implementation of the Survey and Manage Standards and Guidelines, the PCFFA ruling, and protest and appeals, the Oregon BLM regeneration harvest timber sales sold during fiscal years 1999-2001 were reduced by 89 percent when compared to the fiscal year 1995-1998 timeframe. Regeneration harvest sales of stands 200 years and older was reduced by 88 percent during this timeframe. The 1995-1998 timber sales were 22 percent less than the harvest assumptions under the Northwest Forest Plan (BLM Annual Program Summaries).

Figure 3&4-5. Acreage of Species Sites identified through 2001 under the alternatives.



The environmental consequences need to be based in the context of full implementation of the Northwest Forest Plan PSQ (805 MMBF/year). With the recent years of reduced levels of timber sale offerings (35 percent of PSQ) and limits on regeneration harvest of older forest and more emphasis on thinning of younger forest, the ISMS database does not reflect the number of species/sites that would be identified under the full PSQ. With more implementation experience since the 2000 Survey and Manage Final SEIS, two additional effects have been identified that are not reflected in the ISMS-based calculation of acres for existing sites or in the 2000 Survey and Manage Final SEIS timber harvest projections.

- Avoidance - When initial sale reconnaissance indicates the presence of numerous Survey and Manage species sites, sale areas are abandoned and no specific sites may be recorded in ISMS. The Agencies have sought to offer timber sales (thinning, avoidance of older forest) where it is less likely Survey and Manage species will encumber the sale.

- Abandonment - Red tree vole surveys provide an example of the trade-offs managers face in use of staff time and dollars for preparing timber sales. Pre-disturbance surveys indicate nest structures within the sale area but only those nest structures associated with red tree vole activity require protection. Each site associated with activity commonly receives a 10-acre management area. Examples from 5 recent thinning sales in the Eugene BLM identified from 30 to 100 nest structures in each sale area. These trees were climbed to determine which sites were associated with red tree vole activity. Fifty percent of these nest structures were confirmed to be associated with activity and the buffers applied reduced the sale areas by approximately 50 percent. When managers are faced with numerous nest structures in the sale area, they must weigh the additional staff work for reconfiguring the sale, and cost in climbing the trees versus abandonment of the sale area. This situation extends beyond red tree vole when identified sites are so numerous that it results in an infeasible sale.

Sale areas that are avoided or abandoned are not fully reflected in the ISMS database and the estimation of existing acreage of managed sites.

Projection of Acres of Managed Sites

The projections of acres of managed sites within the Matrix and Adaptive Management Areas utilized the ISMS database to establish the number of acres associated with the species under the alternatives as well as the find rates for these species. Additional factors were incorporated into the projection of effects to account for the factors which are not reflected in the ISMS data:

- The last 4 years of sale offerings (35 percent of PSQ) do not reflect full Northwest Forest Plan PSQ implementation.
- These sales have placed an emphasis on thinning and partial cut harvest with less regeneration harvest.
- There has been avoidance of harvest in older forest conditions.
- There has been avoidance of areas where Survey and Manage species would likely encumber sales.
- The Survey and Manage mitigation measure has resulted in abandonment of portions and/or entire sale areas.

The existing acreage of sites identified since 1998 were increased by 100 percent in the projection for Alternative 1 to account for the factors listed above. Given that there are fewer numbers of species under Alternatives 2 and 3, it is assumed that the degree of avoidance and abandonment would be less, so the sites identified since 1998 were increased by 50 percent in the projection for these alternatives.

Those species with more than 100 acres in known sites within the Matrix and Adaptive Management Areas had projection caps applied in the Survey and Manage Final SEIS 2000 to simulate the adaptive management process. These same assumptions were applied under the projections for all of the alternatives.

The existing sites under Survey and Manage which are assumed to have been implemented with timber sales but under Alternatives 2 and 3 are now "released" have an effect on the PSQ. Acreage of existing sites established in timber sales in which regenerations harvest has occurred are unavailable for harvest for several decades and has a long-term effect on PSQ. Those existing sites implemented in thinning or partial cut harvest are available for harvest with the next entry which has less of a long-term effect. To account for this PSQ effect, 50 percent of acreage of the existing sites which are "released" from future site management under Alternatives 2 and 3 are assumed to reduce the 1.1 million acres of late-successional forest available for harvest.

A summary of the acres of late-successional forest in the Matrix and Adaptive Management Areas that are projected to be managed as known sites under each alternative is shown on Figure 3&4-6.

As previously described, the percent of late-successional forest projected for management of known sites has a corresponding effect on the 1.1 million acres of late-successional forest in the Matrix and Adaptive Management Areas which supports the PSQ. For example, the projection of sites under Alternative 1 identified 18 percent of the 1.1 million acres of existing late-successional forest would be managed for known sites. The 18 percent of the 709 MMBF of PSQ associated with late-successional forests equates to the projected PSQ reduction of 130 MMBF (rounded to nearest 5 MMBF). The projected PSQ reduction from the current 805 MMBF PSQ baseline for each alternative is shown in Figure 3&4-7. Note: these projections provide the relative magnitude effect on the PSQ for purposes of comparing alternatives. This analysis is not intended to have the precision necessary for re-declaring the PSQ for the National Forests and BLM Districts.

Comparison of Effects of the Alternatives

The primary factor affecting the PSQ between the alternatives is the number of species and resulting acreage of known sites affecting the 1.1 million acres of late-successional forest within the Matrix and Adaptive Management Areas.

Figure 3&4-6. Projected Acres of Survey and Manage Sites Affecting PSQ. The projected acreage of known sites affecting the 1.14 million acres of late-successional forest within the Matrix and Adaptive Management Areas for each alternative.

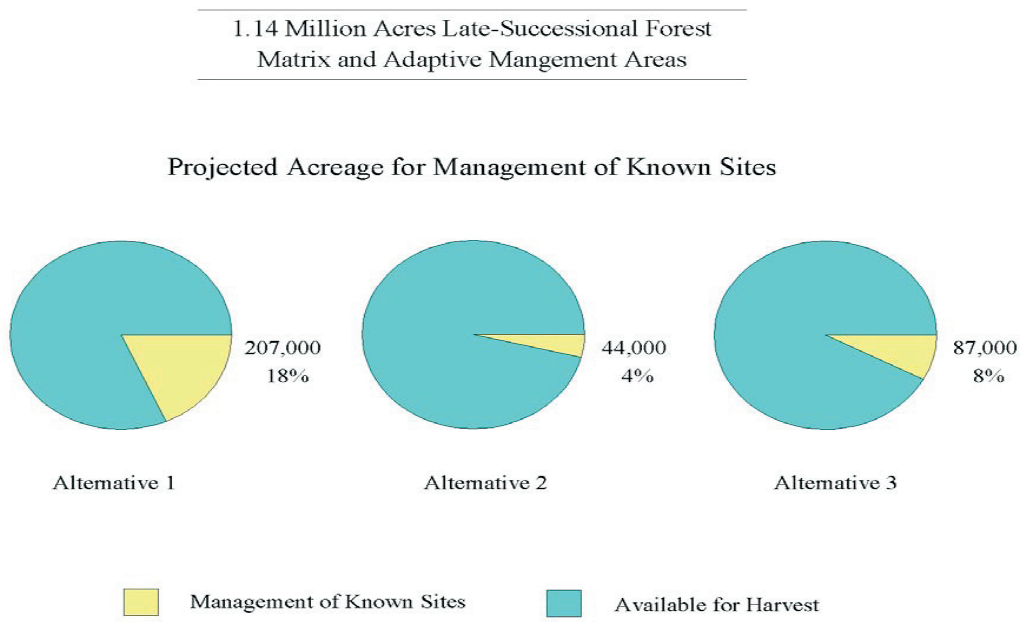
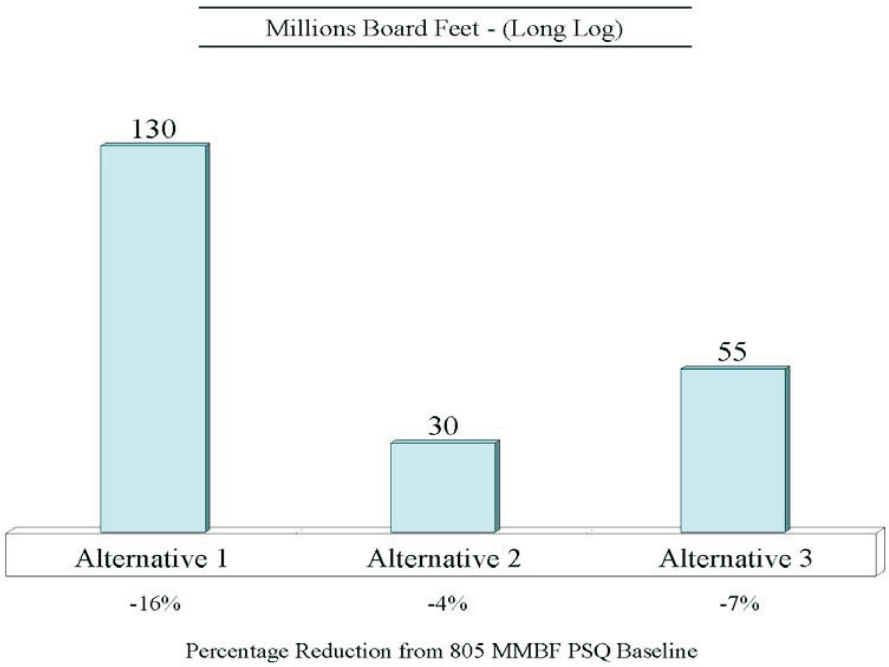


Figure 3&4-7. Projected PSQ Reductions in Million Board Feet from the current 805 MMBF Baseline.



Alternative 1

Red tree vole accounts for approximately 25 percent of the projected acreage. The projections for red tree vole accounted for implementation of high-priority sites in the future. An additional 9 species had more than 1,000 projected acres each which accounted for approximately 12 percent

Table 3&4-6. Comparison of Timber Harvest Effects.

	Alternative 1	Alternative 2	Alternative 3
Number of Species/Guilds Included	308	130	287
Number of Species identified in Matrix / Adaptive Management Areas through Pre-Disturbance Surveys Since 1998	144	47	126
Existing Acreage of Sites in the Matrix and Adaptive Management Areas	26,600	9,900	16,500
Projected Acreage of Sites in the Matrix and Adaptive Management Areas + Existing	207,000	44,000	87,000
Projected Acreage of Sites as a percentage of the 1.1 million acres of late-successional forest in the Matrix and Adaptive Management Areas	18%	4%	8%
Projected PSQ Reduction in MMBF (rounded to nearest 5 MMBF)	130	30	55
Reduction in MMBF for Mitigation	-	10	3
Projected PSQ Reduction with Mitigation in MMBF (rounded to nearest 5 MMBF)	-	40	55
Projected PSQ Percentage Reduction from 805 MMBF baseline (with mitigation)	16%	5%	7%

of the projected acreage. Of the 304 species included in the Survey and Manage mitigation measure, there are 10 that account for approximately 38 percent of the projected acres and resulting effect on PSQ.

Alternative 2

Under Alternative 2, there would be a 100 MMBF increase in PSQ compared to Alternative 1.

Of the 130 species assumed to be included in the Special Status Species Programs, there are 4 species with projected acres of more than 1,000 each that account for approximately 24 percent of the total projected acres and resulting effect on PSQ.

Mitigation for 63 species, under Alternative 2, would require 10 MMBF for management of known sites.

Under Alternative 2, the total PSQ increase (accounting for mitigation) is 90 MMBF compared to Alternative 1.

Alternative 3

Under Alternative 3, there would be a 75 MMBF increase in PSQ over Alternative 1.

Of the 287 species assumed to be included in this alternative, there are 9 species with more than 1,000 projected acres each that account for approximately 25 percent of the total projected acres and resulting effect on PSQ.

Mitigation for 10 species, under Alternative 3, would require 3 MMBF for management of known sites.

Under Alternative 3, the total PSQ increase (accounting for mitigation) remains at 75 MMBF compared to Alternative 1 (due to rounding).

Northwest PSQ - Context and Cumulative Effects

The 1994 Northwest Forest Plan Final SEIS included a 6 MMBF reduction in the PSQ for the management of existing known sites under Survey and Manage. Since little was known about these species in 1994, it was assumed that the effects on the PSQ would be minor since it was anticipated these species were relatively rare. Based on the analysis of effects in the 2000 Survey and Manage Final SEIS and this SEIS, it has been demonstrated that the Survey and Manage mitigation measure within the Matrix and Adaptive Management Areas, under any of these alternatives, has impacted the PSQ to a greater extent than was anticipated in 1994.

The Northwest Forest Plan PSQ is the combined result of the harvest levels as stated in the individual Forest and District land and resource management plans. Harvest levels are established based on a set of forest management assumptions including the intensity of harvest, the acreage available for harvest, and the types of forest available. All of these harvest-level assumptions are based in the long-term context of decades of implementation and forest growth.

The projections of effects for alternatives to the current Survey and Manage program can be quantified at the regional level to provide the relative effect on the PSQ in the long term. These effects are largely based on the reduction in land available for harvest as a result of managing individual species sites within Matrix and Adaptive Management Areas.

In recent years, timber sale offerings have also been constrained because of biological opinions related to harvests in watersheds with threatened or endangered anadromous fish (ESA

consultation issues associated with the Pacific Coast Federation of Fishermen's Associations et al. v. National Marine Fisheries Service lawsuits). The Aquatic Conservation Strategy SEIS along with other administrative actions are seeking to clarify and resolve issues caused by these constraints. These actions are ongoing and have not resulted in a decision to alter the long-term direction for harvest under the Northwest Forest Plan.

Scale and Precision

This analysis of PSQ effects has been done at the planning area scale and does not consider the exact effects of the changes in the lands available for harvest at smaller scales. Effects at the administrative unit would vary from this regional-level analysis. This analysis is not intended to have the precision necessary for re-declaring the PSQ for the affected National Forests and BLM Districts. Actual PSQ will be affected by the number of sites that are found and future adaptive management decisions. Modifications to National Forest and BLM District level PSQ need to be based on the accumulation of specific, unit-level effects during administrative unit plan revisions. At the Northwest Forest Plan area-wide scale, the PSQ effects calculated here are reasonable estimates of both the magnitude of effects and of the differences between the alternatives.

Additional information about methodology and assumptions in this analysis is included in the administrative record and is available upon request.

Socioeconomic Effects

Background and Affected Environment

The Northwest Forest Plan Final SEIS addressed socioeconomic effects. The Survey and Manage Final SEIS 2000 examined alternative ways to change only one aspect, the Survey and Manage Standards and Guidelines of the Northwest Forest Plan. This SEIS also examines an alternative way to change only one aspect of the Northwest Forest Plan. Since it supplements the previous analyses, this SEIS does not repeat the analysis and conclusions in those documents that are unaffected by the proposals in this SEIS. The following analysis presents information of effects that would be different than those identified in the Survey and Manage Final SEIS 2000. In many cases, effects are the same type previously identified, but vary in scope or extent as a result of alternatives analyzed in this SEIS. In these instances, the same assumptions used by the Survey and Manage Final SEIS 2000 are used by this SEIS.

Environmental Consequences

Mineral Resources, Recreation Resources, and Special Forest Products

Impacts on these programs are correlated to the number of species requiring pre-disturbance surveys (USDA, USDI 2000a, pp. 420-422). The potential conflicts with these programs would be less under Alternative 2 compared to Alternatives 1 and 3 because 130 species would be managed under the Special Status Species Programs under Alternative 2 compared to 308 and 287 species managed under Alternatives 1 and 3, respectively.

Range/Grazing Resources

As discussed in the Survey and Manage Final SEIS (USDA, USDI 2000a, p. 421), impacts to grazing are not discernibly different among the alternatives. Pre-disturbance surveys, management of known sites, and strategic surveys are not anticipated to change the conclusions of

the Northwest Forest Plan Final SEIS regarding impacts to grazing. That document concluded, "... consequences to the industry would be small based on the relatively minor amount of range production on federally managed lands within the planning area. These modifications would likely have consequences, however, for individual permittees" (USDA, USDI 1994a p. 3&4-276).

Commercial and Subsistence Fisheries Resources

None of the alternatives is anticipated to directly impact commercial or subsistence fisheries (USDA, USDI 2000a).

Lumber and Wood Products Employment

Actual timber harvest, a primary driver of economic, community, and social effects, has lagged behind levels projected in the Northwest Forest Plan Final SEIS for a variety of reasons as stated in the Survey and Manage Final SEIS (USDA, USDI 2000a, p. 422). The Northwest Forest Plan Final SEIS estimated employment affected per million board feet of timber processed by subregion. A region-wide average was also estimated. Since no new information is available to revise these statistics, they continue to be used for analytical purposes within the Northwest Forest Plan area. An estimated 9.08 jobs are generated within the region per million board feet harvested and processed.

The current (2000 annual average) employment in the lumber and wood products industry is approximately 56,900 people in Oregon, 48,927 people in Washington, and 10,120 people in northern California counties. The employment figures for Oregon and Washington include the paper industry (Stevenson 2002, pers. comm.; State of California, Employment Development Department 2002; and Washington State Employment Security Department 2000).

Lumber and Wood Products employment changes have been close to the impacts projected in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a). Actual employment declines between 1990, the baseline used by the Northwest Forest Plan Final SEIS, and the 2000 Survey and Manage Final SEIS have been about 8,460 jobs in Washington, 16,300 jobs in Oregon, and 3,780 jobs in northern California. Projected changes under the alternative selected in the Northwest Forest Plan Record of Decision (Alternative 9) were: 9,500 in western Washington, 16,700 in western Oregon, and 2,800 in northern California.

All alternatives have an adverse effect on PSQ that was not anticipated in the Northwest Forest Plan Final SEIS (see Survey and Manage Final SEIS 2000, p. 429). A comparison of annual employment associated with the alternatives is shown in Table 3&4-7. The full harvest level under the Northwest Forest Plan is currently 805 MMBF which would support 7,309 jobs.

Survey-Related Employment

The Costs of Management section earlier in this chapter examines the estimated costs of implementing each alternative. The assumptions used to build those estimates include direct survey costs (such as labor, vehicles, equipment, and lab fees) and overhead. Labor costs were assumed to represent 46.8 percent of total survey costs. This represents 60 percent costs after deduction of overhead. Table 3&4-8 displays the estimated total cost by alternative and the

Table 3&4-7. Comparison of Annual Employment.

	Alternative 1	Alternative 2	Alternative 3
Employment decrease from full Northwest Forest Plan harvest level	-1,180 (-16%)	-272 jobs (-4%)	-499 jobs (-7%)
Employment decrease from full Northwest Forest Plan with mitigation	No mitigation	-363 jobs (-5%)	-499 jobs (-7%)

portion attributed to labor. The potential mitigation of Alternative 3 would not materially add to the costs of that alternative.

The methodology and assumptions used in the Survey and Manage Final SEIS (USDA, USDI 2000a, p. 424) are used for this analysis.

As in the 2000 Survey and Manage Final SEIS the same three titles: (1) Biological, Agricultural, and Food Technicians; (2) Forest and Conservation Workers; and, (3) Surveying and Mapping Technicians are used. The weighted average median wage for these occupations was $10.91 per hour (Oregon Employment Department 2002). For comparison, the weighted average median wage for the 22 major occupational titles in the Lumber and Wood Products industry was $15.61 per hour (Oregon Employment Department 2002 and Stevenson 2000, pers. comm.).

The Northwest Forest Plan Final SEIS did not specifically anticipate employment associated with species surveys. Table 3&4-9 displays estimated annual survey-related employment by alternative. The potential mitigation of Alternative 3 would not materially add to the survey related employment associated with that alternative.

Government Revenues

As stated in the 2000 Survey and Manage Final SEIS, the analysis of impacts to government revenues in the Northwest Forest Plan Final SEIS did not include legislation that has provided an ongoing "special payment amount," also known as safety net payments. Current legislation, passed October 30, 2000, provides for annual payments based on the average of the highest 3 years of payments between 1986 and 1999. It applies to the BLM "50-percent payments" and to the Forest Service "25-percent payments" through fiscal year 2006, and also allows for annual increases based on the Consumer Price Index.

To the extent that the alternatives reduce federal timber harvest below levels anticipated in the Northwest Forest Plan Final SEIS, federal revenue sharing would also be reduced beginning in 2006. Reductions would be greatest under Alternative 1 followed by Alternative 3 and Alternative 2 (see Timber Harvest section). Effects of reduced payments to the counties would be the same type as those identified in the Northwest Forest Plan Final SEIS, but to a greater extent (USDA, USDI 2000a, p. 426).

Community Capacity

Community capacity involves the ability of residents, community institutions, organizations, and leadership (formal and informal) to meet local needs and expectations. Neither alternative would change the capacity ratings assigned by the Northwest Forest Plan Final SEIS (USDA, USDI 2000a, p. 426).

Table 3&4-8. Estimated Total Cost By Alternative and Portion Attributed to Labor (in millions of dollars).

Costs	Alternative 1	Alternative 2		Alternative 3	
		Un-mitigated	Mitigated	Un-mitigated	Mitigate
Total Cost	25.9	7.5	8.1	11.8	14.0
Labor Cost	12.1	3.5	3.8	5.5	5.5

Table 3&4-9. Annual Survey-Related Employment, Full-Time Equivalents (FTE).

Rate of Pay	Alternative 1	Alternative 2		Alternative 3	
		Un-mitigated	Mitigated	Un-mitigated	Mitigated
FTE @ $10.91/hour*	533	154	167	242	242

*Median wage $12.85 for 2000

People Coping with Change

Four factors of social and cultural disruption were noted in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a, p. 3&4-307). Alternatives 1 and 3 include the Survey and Manage mitigation measure and would influence the first three of the following four factors.

- a shift from decentralized participatory forest land management that is oriented toward communities and workers to a centralized command and control for forests both public and private,
- the perception that the federal government has reneged on its commitment to maintain non-declining, even flow of timber from federal forests,
- a social structure that is less likely to adapt to a permanent loss of employment, and
- the potential for conflict among different people in which the timber industry and workers, as well as other interested groups, are negatively stereotyped and stigmatized.

No change is anticipated in the level of controversy associated with public land management generally, and late-successional or old-growth forests specifically, because this SEIS also addresses only one of many issues associated with federal land management (USDA, USDI 2000a, p. 426).

As stated in the Northwest Forest Plan Final SEIS "these factors can impose a significant emotional impact, and all can undermine individual and community efforts to successfully adapt to changes" (USDA, USDI 1994a p. 3&4-307).

Environmental Justice

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994) requires that all federal agencies "make achieving Environmental Justice part of [their] mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Thirty-three of the 51 counties covered by the Northwest Forest Plan have poverty rates above the rate for the state in which they are located. Nine of the 51 counties covered by the Northwest Forest Plan have African American populations above the rate for the state in which they are located. Nine of the 51 counties under the Northwest Forest Plan have Asian populations above the rate for the state in which they are located. Thirty-four of the 51 counties under the Northwest Forest Plan have Pacific Islander populations above the rate for the state in which they are located. Five of the 51 counties covered by the Northwest Forest Plan have Hispanic (any race) populations above the rate for the state in which they are located. Twenty-nine of the 51 counties covered by the Northwest Forest Plan have Native American populations above the rate for the state in which they are located (USDA Economic Research Institute 2002 and Bureau of Census 2000). There are 25 federally recognized tribes in California and 36 in Oregon and Washington (USDA, USDI 1994a, p. 3&4-314).

Under all alternatives, Native American subsistence uses (such as bark and root collecting) may be suspended or restricted until surveys can be completed for activities that are deemed habitat disturbing by the Agencies.

These impacts to subsistence uses may impact treaty-reserved rights and, therefore, the Agencies' ability to execute its trust responsibilities. The protection of tribal treaty rights and trust resources is addressed starting on page 54 of the Northwest Forest Plan ROD. Through the scoping and public involvement process on this SEIS there has been no specific identification of Survey and Manage species that are a particular concern of or used by the tribes.

There is high participation by minority and low-income populations in collecting special forest products. Permits for collecting wild plants, some mosses, bark, roots, and boughs could be restricted until surveys can be completed where such collections are deemed habitat-disturbing by the Agencies.

The potential impacts to environmental justice described above would be less under Alternative 2 because there are 130 species compared to 308 species under Alternative 1 and 287 species under Alternative 3 that require surveys and management of sites.

Species Values

As stated in the Survey and Manage Final SEIS 2000, the Survey and Manage species examined in this SEIS have no known use value to people. They are not collected for food, shelter, or decoration. However, they have a variety of non-use values which include ongoing and new scientific research, recreational observation, and photography (USDA, USDI 2000a, p. 428).

Critical Elements of the Human Environment

The following are critical elements of the human environment: air quality, floodplains, cultural/paleontological, prime or unique farmlands, Native American religious concerns, Threatened or Endangered Species, areas of critical environmental concern, designated or potential wild and scenic rivers, wilderness or wilderness study areas, and environmental justice. There are no identified significant impacts to any of these elements under the three alternatives.

Other Environmental Consequences

It is important to bear in mind the context of this SEIS when considering the overall environmental impacts of this proposal. This SEIS supplements previous impact statements which included 28 Final Environmental Impact Statements for Forest Service and BLM land and resource management plans. These plans were amended by the Northwest Forest Plan Final SEIS (USDA, USDI 1994a). The Northwest Forest Plan Final SEIS addressed issues and environmental impacts dealing with the full range of multiple uses on federal lands and led to sweeping decisions regarding timber management and resource conservation. The Survey and Manage Final SEIS 2000 was narrowly focused on issues concerning implementation of the Survey and Manage Standards and Guidelines. This SEIS is also narrowly focused on the Survey and Manage Standards and Guidelines. The Survey and Manage Final SEIS 2000 and this SEIS only address changes to the Survey and Manage Standards and Guidelines and do not change the fundamental decisions or substantially change environmental impacts disclosed in the previous impact statements.

The Council on Environmental Quality (CEQ) regulations require that the discussion of environmental consequences include "...any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented" (40 CFR 1502.16).

Adverse Environmental Effects Which Cannot Be Avoided

An agency does not have to avoid adverse effects, but must identify and disclose any adverse environmental, social, and economic effects in the impact statement. This SEIS incorporates by reference the Northwest Forest Plan SEIS and the Survey and Manage Final SEIS 2000. Both documents included extensive discussions of effects, both beneficial and adverse. This SEIS

supplements those documents and need not restate impacts disclosed in the previous impact statements. This SEIS addresses only those adverse effects caused by the alternatives herein. Adverse effects which cannot be avoided include a high risk of extirpation for 137 species under all alternatives. No mitigation could be proposed that could remove this high risk.

Relationship Between Short-term Uses of the Human Environment and Maintenance of Long-term Productivity

The Agencies' land and resource management plans, as amended by the Northwest Forest Plan, committed National Forest System and BLM administered lands to multiple use, including commercial timber commodity production. The environmental analyses supporting those plans determined that the loss in long-term productivity of forest soils and other components necessary for a healthy forest environment would be minimal. All alternatives explored in this SEIS are projected to impact fewer acres than analyzed for the land and resource management plans and, as such, will have less impact on productivity than previously disclosed.

Irreversible or Irretrievable Impacts

Irreversible refers to a loss of non-renewable resources, such as mineral extraction, heritage (cultural) resources, or to those factors, which are renewable over long time spans such as soil productivity. Irretrievable commitment applies to losses that are temporary, such as loss of forage production in an area being used as a ski run or use of renewable natural resources.

Old-growth forests would be harvested in the Matrix and Adaptive Management Areas under all alternatives. The Northwest Forest Plan considered the loss of old growth to be irretrievable (USDA, USDI 1994a, p. 3&4-321). The projected harvest of late-successional forest under Alternative 1 would be 933,000 acres. The projected harvest of late-successional forest under Alternatives 2 and 3 would be 1,096,000 and 1,053,000 acre, respectively. However, the total acreage harvested would still be less than that projected in the Northwest Forest Plan Final SEIS.

Extirpation of species could be an irreversible or irretrievable impact depending on circumstances. In some cases, species may re-colonize an area following extirpation. There would be 137 species at high risk of extirpation under all alternatives. No mitigation could be proposed that could remove this high risk.

Conflicts with Other Plans

The CEQ regulations (40 CFR 1502.16) require a discussion of "possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned." This SEIS incorporates by reference the discussion in the Northwest Forest Plan Final SEIS concerning conflicts with other plans (USDA, USDI 1994a, pp. 3&4-319 and 320, and Appendix D). Removing the Survey and Manage Standards and Guidelines as proposed in Alternative 2 would not alter the conclusion of the Northwest Forest Plan Final SEIS regarding the possible conflicts with other plans. Modifying the Survey and manage Standards and Guidelines as proposed in Alternative 3 also would not alter the conclusion of the Northwest Forest Plan Final SEIS regarding conflicts with other plans.

The management direction in this SEIS applies only to federally managed lands where state and local land use plans, policies, and controls have little application. Similarly, none of the alternative in this SEIS apply to tribal and Indian-owned lands, with one exception. The Coquille Indian Tribe currently manages approximately 5,400 acres of forest lands (Coquille Forest) under

the same standards and guidelines as the adjacent federal land management agency (Coos Bay District, BLM). This places them in a unique position as the only tribe in the Northwest Forest Plan area that must comply with the Northwest Forest Plan Standards and Guidelines, including Survey and Manage.

In recent years, western states have raised concerns about the occurrence of catastrophic wildfires. This sentiment led to formation of the National Fire Plan, a national multi-agency policy designed to prevent catastrophic wildfires through broad-scale fuel treatment and improved suppression efforts. The National Fire Plan proposes aggressive hazardous fuel abatement activities around communities and at-risk landscapes. The 2002 fire season was particularly problematic for the Northwest Forest Plan area. Inflexible and complex management recommendations in the Survey and Manage Standards and Guidelines impeded the Agencies' ability to meet National Fire Plan objectives. Conflicts between these policies and the Survey and Manage Standards and Guidelines led, in part, to the proposed action.

Alternatives 2 and 3 result in more acres available for hazardous fuel treatments at a lower cost than under Alternative 1. Under Alternative 1, fuel treatment is precluded by species protection on about 31,200 acres per year. Under Alternative 2, about 3,400 acres would be precluded from treatment. Under Alternative 3, about 9,100 acres would be precluded from treatment. Costs are similarly affected. Fuel treatment cost under Alternative 1 is $134 per acre. Cost under Alternative 2 would be $44 per acre. Cost under Alternative 3 would be $52 per acre.

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP *Species*	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
FUNGI						
Acanthophysium farlowii (Aleurodiscus farlowii)		B	1	1	1	2
Albatrellus avellaneus		B	1	3	1	3
Albatrellus caeruleoporus		B	4	9	4	9
Albatrellus ellisii		B	12	13-15	39	41
Albatrellus flettii, In Washington and California		B	24	28	39	43
Alpova alexsmithii		B	6	6	6	6
Alpova olivaceotinctus		B	1	1	1	1
Arcangeliella camphorata (*Arcangeliella* sp. nov. #Trappe 12382; *Arcangeliella* sp. nov. #Trappe 12359)		B	6	9	8	11
Arcangeliella crassa		B	2	2	2	2
Arcangeliella lactarioides		B	3	3	3	3
Asterophora lycoperdoides		B	1	4	1	5
Asterophora parasitica		B	1	5	1	5
Baeospora myriadophylla		B	9	17	9	17
Balsamia nigrens (Balsamia nigra)		B	1	4	1	4
Boletus haematinus		B	1	1	1	1
Boletus pulcherrimus		B	2	8	6	12
Bondarzewia mesenterica (Bondarzewia montana), In WA and California		B	18	19	22	23
Bridgeoporus nobilissimus (Oxyporus nobilissimus)		A	10	13	48	60
Cantharellus subalbidus, In Washington and California		D	29	36	53	68
Catathelasma ventricosa		B	6	14	6	15
Chalciporus piperatus (*Boletus piperatus*)		D	42	71	43	76
Chamonixia caespitosa (*Chamonixia pacifica* sp. nov. #Trappe #12768)		B	3	5	3	5
Choiromyces alveolatus		B	7	8	7	8
Choiromyces venosus		B	1	1	2	2
Chroogomphus loculatus		B	3	3	4	4
Chrysomphalina grossula		B	9	13	9	14
Clavariadelphus ligula		B	24	28	41	47
Clavariadelphus occidentalis (*Clavariadelphus pistillaris*)		B	31	43	57	70
Clavariadelphus sachalinensis		B	5	7	29	34
Clavariadelphus subfastigiatus		B	1	1	5	5
Clavariadelphus truncatus (syn. *Clavariadelphus borealis*)		D	34	39	106	118
Clavulina castanopes v. *lignicola* (*Clavulina ornatipes*)		B	4	10	4	11
Clitocybe senilis		B	1	1	5	5
Clitocybe subditopoda		B	2	2	2	4
Collybia bakerensis		F	12	12	124	129
Collybia racemosa		B	15	30	17	34
Cordyceps ophioglossoides		B	9	12	9	12
Cortinarius barlowensis (syn. *Cortinarius azureus*)		B	0	0	0	0
Cortinarius boulderensis		B	8	8	8	9
Cortinarius cyanites		B	0	0	1	1
Cortinarius depauperatus (*Cortinarius spilomeus*)		B	1	1	1	1

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
Cortinarius magnivelatus		B	2	2	8	8
Cortinarius olympianus		B	26	27	41	42
Cortinarius speciosissimus (Cortinarius rainierensis)		B	4	4	5	5
Cortinarius tabularis		B	0	0	0	0
Cortinarius umidicola (Cortinarius canabarba)		B	1	1	1	1
Cortinarius valgus		B	0	0	0	0
Cortinarius variipes		B	3	3	4	5
Cortinarius verrucisporus		B	0	0	7	8
Cortinarius wiebeae		B	1	1	1	1
Craterellus tubaeformis (syn. *Cantharellus tubaeformis)*, In Washington and California		D	31	40	33	50
Cudonia monticola		B	7	7	12	12
Cyphellostereum laeve		B	3	3	3	3
Dermocybe humboldtensis		B	1	1	1	3
Destuntzia fusca		B	1	2	1	3
Destuntzia rubra		B	0	2	0	4
Dichostereum boreale (Dichostereum granulosum)		B	1	1	1	1
Elaphomyces anthracinus		B	1	1	1	1
Elaphomyces subviscidus		B	1	1	1	1
Endogone acrogena		B	3	3	3	3
Endogone oregonensis		B	3	7	3	7
Entoloma nitidum (Rhodocybe nitida)		B	6	7	6	7
Fayodia bisphaerigera (Fayodia gracilipes)		B	2	2	10	14
Fevansia aurantiaca (Alpova sp. nov. # Trappe 1966) (*Alpova aurantiaca*)		B	2	2	2	2
Galerina atkinsoniana		B	12	12	28	29
Galerina cerina		B	1	1	3	3
Galerina heterocystis		E	0	0	3	7
Galerina sphagnicola		E	0	0	0	0
Gastroboletus imbellus		B	1	1	1	1
Gastroboletus ruber		B	15	15	25	25
Gastroboletus subalpinus		B	20	21	29	30
Gastroboletus turbinatus		B	0	0	3	4
Gastroboletus vividus (*Gastroboletus* sp. nov. #Trappe 2897; *Gastroboletus* sp. nov. #Trappe 7515)		B	3	3	3	3
Gastrosuillus amaranthii (*Gastrosuillus* sp. nov. #Trappe 9608)		E	0	0	0	0
Gastrosuillus umbrinus (*Gastroboletus* sp. nov. #Trappe 7516)		B	1	1	1	1
Gautieria magnicellaris		B	2	2	2	2
Gautieria otthii		B	1	2	1	2
Gelatinodiscus flavidus		B	14	14	19	19
Glomus radiatum		B	2	3	2	3
Gomphus bonarii		B	14	15	77	80
Gomphus clavatus		F	35	45	71	96
Gomphus kauffmanii		E	31	42	43	54

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
Gymnomyces abietis (*Gymnomyces* sp. nov. #Trappe 1690, 1706, 1710; *Gymnomyces* sp. nov. #Trappe 4703, 5576; *Gymnomyces* sp. nov. #Trappe 5052; *Gymnomyces* sp. nov. #Trappe 7545; *Martellia* sp. nov. #Trappe 1700; *Martellia* sp. nov. #Trappe 311; *Martellia* sp. nov. #Trappe 5903)		B	18	18	21	21
Gymnomyces nondistincta (*Martellia* sp. nov. #Trappe 649)		B	1	1	1	1
Gymnopilus punctifolius, In California		B	0	5	0	5
Gyromitra californica		B	9	9	22	22
Hebeloma olympianum (Hebeloma olympiana)		B	5	5	6	6
Helvella crassitunicata		B	20	20	25	25
Helvella elastica		B	25	25	33	36
Hydnotrya inordinata (*Hydnotrya* sp. nov. #Trappe 787, 792)		B	3	3	3	3
Hydnotrya subnix (Hydnotrya subnix sp. nov. #Trappe 1861)		B	1	1	1	1
Hydropus marginellus (Mycena marginella)		B	9	13	9	14
Hygrophorus caeruleus		B	1	2	4	5
Hygrophorus karstenii		B	0	0	0	0
Hygrophorus vernalis		B	1	1	1	1
Hypomyces luteovirens		B	7	9	7	11
Leucogaster citrinus		B	7	7	8	21
Leucogaster microsporus		B	7	7	7	7
Macowanites chlorinosmus		B	2	11	2	11
Macowanites lymanensis		B	1	1	1	1
Macowanites mollis		B	2	2	3	3
Marasmius applanatipes		B	2	2	2	2
Martellia fragrans		B	3	3	3	3
Martellia idahoensis		B	2	2	2	2
Mycena hudsoniana		B	6	7	6	7
Mycena overholtsii		D	15	17	130	136
Mycena quinaultensis		B	3	5	3	9
Mycena tenax		B	12	18	12	29
Mythicomyces corneipes		B	8	9	8	9
Neolentinus adhaerens		B	3	4	3	4
Neolentinus kauffmanii		B	19	31	20	34
Nivatogastrium nubigenum, In entire range except OR Eastern Cascades and CA Cascades Physiographic provinces		B	6	6	8	8
Octavianina cyanescens (*Octavianina* sp. nov. #Trappe 7502)		B	1	1	1	1
Octavianina macrospora		B	0	0	0	0
Octavianina papyracea		B	0	1	0	1
Otidea leporina		D	18	18	101	110
Otidea smithii		B	4	5	11	12
Phaeocollybia attenuata		D	30	57	78	106
Phaeocollybia californica		B	26	31	39	44
Phaeocollybia dissiliens		B	8	8	16	18
Phaeocollybia fallax		D	23	48	61	88
Phaeocollybia gregaria		B	2	2	4	4

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
Phaeocollybia kauffmanii		D	39	57	78	97
Phaeocollybia olivacea, In Oregon		F	0	0	0	0
Phaeocollybia olivacea In Washington and California		E	5	14	6	18
Phaeocollybia oregonensis (syn. *Phaeocollybia carmanahensis*)		B	3	3	31	36
Phaeocollybia piceae		B	10	12	41	46
Phaeocollybia pseudofestiva		B	10	15	21	31
Phaeocollybia scatesiae		B	5	5	13	13
Phaeocollybia sipei		B	2	2	38	42
Phaeocollybia spadicea		B	15	27	41	56
Phellodon atratus (Phellodon atratum)		B	8	28	8	29
Pholiota albivelata		B	6	13	7	14
Podostroma alutaceum		B	4	9	4	9
Polyozellus multiplex		B	30	30	53	55
Pseudaleuria quinaultiana		B	2	2	3	3
Ramaria abietina		B	2	3	4	9
Ramaria amyloidea		B	8	8	14	15
Ramaria araiospora		B	14	15	80	89
Ramaria aurantiisiccescens		B	9	10	22	25
Ramaria botryis var. *aurantiiramosa*		B	0	0	8	10
Ramaria celerivirescens		B	14	15	62	65
Ramaria claviramulata		B	0	0	1	1
Ramaria concolor f. marrii		B	0	0	0	0
Ramaria concolor f. tsugina		B	1	1	4	5
Ramaria conjunctipes var. *sparsiramosa (Ramaria fasciculata* var. *sparsiramosa)*		B	0	0	4	4
Ramaria coulterae		B	6	6	8	8
Ramaria cyaneigranosa		B	7	9	21	27
Ramaria gelatiniaurantia		B	6	9	13	22
Ramaria gracilis		B	1	2	1	2
Ramaria hilaris var. *olympiana*		B	0	0	0	0
Ramaria largentii		B	4	4	8	10
Ramaria lorithamnus		B	0	0	0	0
Ramaria maculatipes		B	3	3	8	8
Ramaria rainierensis		B	0	1	2	3
Ramaria rubella var. *blanda*		B	0	0	0	0
Ramaria rubribrunnescens		B	1	1	9	9
Ramaria rubrievanescens		B	15	15	42	46
Ramaria rubripermanens In Oregon		D	35	42	113	124
Ramaria rubripermanens In Washington and California		B	9	9	10	11
Ramaria spinulosa var. *diminutiva* (*Ramaria spinulosa*)		B	1	1	1	1
Ramaria stuntzii		B	16	18	73	76
Ramaria suecica		B	1	1	1	1
Ramaria thiersii		B	3	3	4	4
Ramaria verlotensis		B	0	1	0	3

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP *Species*	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
Rhizopogon abietis		B	0	0	0	0
Rhizopogon atroviolaceus		B	1	1	1	1
Rhizopogon brunneiniger		B	2	2	6	7
Rhizopogon chamaleontinus (*Rhizopogon* sp. nov. #Trappe 9432)		B	1	1	1	1
Rhizopogon ellipsosporus (*Alpova* sp. nov. # Trappe 9730)		B	1	1	1	1
Rhizopogon evadens var. *subalpinus*		B	18	19	18	19
Rhizopogon exiguus		B	2	3	2	3
Rhizopogon flavofibrillosus		B	6	6	8	8
Rhizopogon inquinatus		B	2	2	2	2
Rhizopogon truncatus		D	2	3	31	55
Rhodocybe speciosa		B	2	2	3	3
Rickenella swartzii (Rickenella setipes)		B	3	6	3	8
Russula mustelina		B	0	0	0	0
Sarcodon fuscoindicus		B	25	37	27	40
Sedecula pulvinata		B	0	0	0	0
Sowerbyella rhenana (Aleuria rhenana)		B	12	16	58	68
Sparassis crispa		D	27	27	59	60
Spathularia flavida		B	11	24	24	38
Stagnicola perplexa		B	7	7	7	7
Thaxterogaster pavelekii (*Thaxterogaster* sp. nov. #Trappe 4867, 6242, 7427, 7962, 8520)		B	3	6	3	7
Tremiscus helvelloides		D	32	40	81	107
Tricholoma venenatum		B	0	0	0	0
Tricholomopsis fulvescens		B	2	2	2	2
Tuber asa (*Tuber* sp. nov. #Trappe 2302)		B	1	1	3	3
Tuber pacificum (*Tuber* sp. nov. #Trappe 12493)		B	2	2	2	3
Tylopilus porphyrosporus (Tylopilus pseudoscaber)		D	18	31	21	34
LICHENS						
Bryoria pseudocapillaris		A	5	8	13	24
Bryoria spiralifera		A	8	8	20	49
Bryoria subcana		B	16	16	18	18
Buellia oidalea		E	4	17	5	18
Calicium abietinum		B	7	7	9	10
Calicium adspersum		E	0	0	0	0
Cetrelia cetrarioides		E	23	23	29	60
Chaenotheca chrysocephala		B	7	7	21	21
Chaenotheca ferruginea		B	9	9	12	12
Chaenotheca furfuracea		F	24	24	123	123
Chaenotheca subroscida		E	0	0	5	5
Chaenothecopsis pusilla		E	0	0	4	4
Cladonia norvegica		B	13	13	59	59
Collema nigrescens, In WA and OR, except in OR Klamath Physiographic province		F	18	21	18	28
Dendriscocaulon intricatulum, In California		E				

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
Dendriscocaulon intricatulum, In all of Washington and Oregon except Coos, Douglas, Curry, Josephine, and Jackson Counties		A				23[6]
Dermatocarpon luridum		E	11	12	12	16
Fuscopannaria saubinetii (syn. *Pannaria saubinetii*)		F	126	126	180	190
Heterodermia sitchensis		E	0	0	0	0
Hypogymnia duplicata		C	70	70	200	211
Hypogymnia vittata (misspelled in FEMAT as *Hygomnia vittiata*)		E	0	0	0	0
Hypotrachyna revoluta		E	1	1	10	10
Leptogium burnetiae var. *hirsutum*		E	1	2	1	4
Leptogium cyanescens		A	3	3	8	10
Leptogium rivale		E	30	30	67	71
Leptogium teretiusculum		E	4	5	7	8
Lobaria linita, Entire range except WA Western Cascades physiographic province north of Snoqualmie Pass and Olympic Peninsula physiographic province		A	-	-	-	29[6]
Lobaria oregana, In California		A	6	6	11	11
Microcalicium arenarium		B	0	0	0	0
Nephroma bellum, In OR; Klamath, Willamette Valley, Eastern Cascades; WA; Western Cascades (outside GPNF), Eastern Cascades, Olympic Peninsula physiographic provinces		E	12	12	20	20
Nephroma isidiosum		E	0	0	0	0
Nephroma occultum		A	95	95	168	168
Niebla cephalota		A	4	11	4	15
Pannaria rubiginosa		E	10	11	10	13
Peltigera pacifica		E	36	36	72	80
Platismatia lacunosa, Except in Oregon Coast Range physiographic province		E	-	-	-	37[6]
Pseudocyphellaria perpetua (misapplied name - *P. mougiotiana in* FEMAT and NWFP, 1994. also called *Pseudocyphellaria sp*. 1 in Management Recommendations (Lesher et al. 2000))		B	1	1	5	5
Pseudocyphellaria rainierensis		A	107	107	167	167
Ramalina thrausta		A	29	29	121	140
Stenocybe clavata		E	2	2	7	7
Teloschistes flavicans		A	2	8	3	9
Tholurna dissimilis, south of Columbia River		B	3	5	3	5
Usnea hesperina		E	7	7	14	17
Usnea longissima, In California and in Curry, Josephine, and Jackson Counties, Oregon		A	13	26	19	26
Usnea longissima, In Oregon, except in Curry, Josephine, and Jackson Counties and in Washington		F	100	100	115	207

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
BRYOPHYTES						
Brotherella roellii		E	5	5	5	5
Buxbaumia viridis, In California		E	1	1	4	5
Diplophyllum plicatum		B	45	45	78	80
Herbertus aduncus		E	4	5	8	9
Iwatsukiella leucotricha		B	2	2	2	2
Kurzia makinoana		B	3	4	3	4
Marsupella emarginata v. aquatica		B	1	1	1	1
Orthodontium gracile		B	1	27	2	29
Ptilidium californicum, In California		A	30	30	228	228
Racomitrium aquaticum		E	14	15	24	28
Rhizomnium nudum, Outside Washington		B	-	-	-	26[6]
Schistostega pennata		A	26	26	59	59
Tetraphis geniculata		A	30	30	57	57
Tritomaria exsectiformis		B	10	10	15	15
Tritomaria quinquedentata		B	3	4	11	12
VERTEBRATES						
Larch Mountain salamander *Plethodon larselli*		A	79	79	88	88
Shasta salamander *Hydromantes shastae*		A	50	50	56	56
Siskiyou Mountains salamander *Plethodon stormi*, North Range		D[1]	138	138	143	143
Siskiyou Mountains salamander *Plethodon stormi*, South Range		A	22	22	30	30
Van Dyke's salamander *Plethodon vandykei*, Cascade population only		A	23	26	23	29
Great Gray Owl *Strix nebulosa*		A	69	69	103	114
Oregon Red Tree Vole *Arborimus longicaudus*, In Central Range)		D[1]	89	89	504	504
Oregon Red Tree Vole *Arborimus longicaudus*, Outside Central Range)		C	25	25	202	202
MOLLUSKS						
Ancotrema voyanum		E[3,4]	18	18	113	113
Cryptomastix devia		A	26	26	121	148
Cryptomastix hendersoni		A	18	22	18	22
Deroceras hesperium		B[4]	2	4	2	4
Fluminicola n. sp. 3		A[2]	2	4	3	5
Fluminicola n. sp. 11		A[2]	2	2	2	2
Fluminicola n. sp. 14		A	3	12	3	12
Fluminicola n. sp. 15		A	0	4	0	4
Fluminicola n. sp. 16		A	0	17	0	17
Fluminicola n. sp. 17		A	0	2	0	2
Fluminicola n. sp. 18		A	1	3	1	3
Fluminicola n. sp. 19		A[2]	0	1	0	1
Fluminicola n. sp. 20		A[2]	0	2	0	2
Fluminicola seminalis		A[2]	5	15	5	15
Helminthoglypta talmadgei		D[1]	93	93	761	761
Hemphillia burringtoni		E	4	31	17	55
Hemphillia glandulosa, In WA Western Cascades Physiographic Province		E	64	64	139	140

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

TAXA GROUP ***Species***	*Note*: Where taxon has more than one name indicated, first name is current accepted name, second one (in parentheses) is name used in Northwest Forest Plan (Table C-3).	**Cate-gory**	**Known Sites in Final SEIS 2000***		**Known Sites Present****	
			Federal Land Only	Total	Federal Land only	Total
Hemphillia malonei, Washington		C	94	94	341	352
Hemphillia pantherina		B[4]	0	0	0	0
Juga (O) n. sp. 2		A	3	7	3	7
Juga (O) n. sp. 3		A	0	4	0	4
Lyogyrus n. sp. 1		A	28	28	49	61
Lyogyrus n. sp. 2		A	3	3	3	3
Lyogyrus n. sp. 3		A	0	1	0	1
Megomphix hemphilli, South of south boundary of Lincoln, Benton, and Linn Counties, Oregon		F[5]	346	346	992	1108
Megomphix hemphilli, North of south boundary of Lincoln, Benton, and Linn Counties, Oregon		A	100	100	681	794
Monadenia chaceana		B[4]	48	48	110	125
Monadenia fidelis minor		A	14	15	60	61
Monadenia infumata ochromphalus (Monadenia fidelis klamathica, Monadenia fidelis ochromphalus)		B[3,4]	38	65	138	154
Monadenia troglodytes troglodytes		A	8	9	8	9
Monadenia troglodytes wintu		A	7	7	7	8
Oreohelix n. sp.		A	25	36	43	54
Pristoloma arcticum crateris		A[2]	13	13	90	90
Prophysaon coeruleum, In California and Washington		A	31	31	112	112
Trilobopsis roperi		A	51	55	140	146
Trilobopsis tehamana		A	4	6	4	7
Vertigo n. sp.		A	1	1	1	1
Vespericola pressleyi		A	19	19	21	21
Vespericola shasta		A	6	12	72	78
Vorticifex n. sp. 1		E	0	2	0	2
VASCULAR PLANTS						
Arceuthobium tsugense mertensianae, In Washington only		F	0	0	2	2
Bensoniella oregana, In California only		A	3	10	3	25
Botrychium minganense, In Oregon and California		A	7	7	13	16
Botrychium montanum		A	53	53	68	68
Coptis asplenifolia		A	14	14	21	21
Coptis trifolia		A	2	3	2	3
Corydalis aquae-gelidae		A	95	101	102	110
Cypripedium fasciculatum, Entire Range except Washington Eastern Cascades physiographic province		C	-	-	-	818[6]
Cypripedium montanum, Entire range except Washington Eastern Cascades physiographic province		C	326	342	393	424
Eucephalus vialis (Aster vialis)		A	31	53	65	89
Galium kamtschaticum, Olympic Peninsula, WA Eastern Cascades, OR & WA Western Cascades physiographic provinces, south of Snoqualmie Pass		A	5-8	5-8	11-14	11-14
Platanthera orbiculata var. *orbiculata* (*Habenaria orbiculata*)		C	82	82	146	146

Table 3&4-1. Number of Known Sites for Species Included in Survey and Manage Standards and Guidelines, November 2000 Final SEIS and Present (March 2003).

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			Federal Land Only	Total	Federal Land only	Total
ARTHROPODS						
Canopy herbivores (south range)		F	-	-	-	-
Coarse wood chewers (south range)		F	-	-	-	-
Litter and soil dwelling species (south range)		F	-	-	-	-
Understory and forest gap herbivores (south range)		F	-	-	-	-

* These numbers were a result of a data call cutoff date of 11/99 and/or 3/2000. Most of the Final SEIS 2000 numbers do not reflect the numbers listed in Table F-1 and F-2 in the 2000 Final SEIS. Numbers in the 2000 Final SEIS likely included sites on non-Federal land, sites not within the Northwest Forest Plan area, and/or historic/non-extant sites. In addition, site definition (and proximity of individual sites) may have changed since the 11/99 data entry cutoff. Also, database clean-ups have also reduced some double counting/entries and some other database errors.

**For certain fungi, data entry deadline was 1/11/02; for great gray owl, amphibians and red tree vole, data entry deadline was 3/8/02; for vascular plants, bryophytes, and certain fungi data entry deadline was 6/7/02; and for mollusks and lichens, data entry deadline was 8/2/02.

[1]Although pre-disturbance surveys are deemed practical, continuing pre-disturbance surveys is not necessary to meet management objectives.

[2]Until Management Recommendations are written: Known and newly discovered sites will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted.

[3]Until Management Recommendations are written, the language known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted is the Management Recommendation. No other recommendations are imposed at this time.

[4]Equivalent-effort pre-disturbance surveys are required for these mollusk species.

[5]This mollusk species requires management of sites known as of 9/30/99.

[6]The range for this species was reduced as a result of the 2002 Annual Species Review (March 2003).

Table 3&4-2. Fish Species Listed (or Proposed for Listing) in the Northwest Forest Plan Area as 1 Endangered or Threatened Under the Federal Endangered Species Act. 1

Endangered
Chasmistes brevirostris (Shortnose sucker)
Deltistes luxatus (Lost River sucker)
Eucyclogobius newberryi (Tidewater goby)
Oncorhynchus mykiss (Upper Columbia River steelhead trout)
Oncorhynchus nerka (Snake River Sockeye Salmon)
Oncorhynchus tshawytscha (Sacramento River winter run chinook salmon)
Oncorhynchus tshawytscha (Upper Columbia River Spring chinook salmon)
Oregonichythys (=Hybopsis) crameri (Oregon chub)
Threatened
Hypomesus transpacificus (Delta smelt)
*Oncorhynchus keta (*Columbia River chum salmon)
Oncorhynchus keta (Hood Canal summer run chum salmon)
Oncorhynchus kisutch (Central California coho salmon ESU)
Oncorhynchus kisutch (Oregon Coastal coho salmon)
Oncorhynchus kisutch (Southern Oregon/Northern California coast coho salmon)
Oncorhynchus mykiss (California Central Valley steelhead)
Oncorhynchus mykiss (Central California Coast steelhead)
Oncorhynchus mykiss (Lower Columbia River steelhead)
Oncorhynchus mykiss (Mid-Columbia River steelhead)
Oncorhynchus mykiss (Snake River Basin steelhead)
Oncorhynchus mykiss (Upper Willamette River steelhead)
Oncorhynchus mykiss (Northern California steelhead)
Oncorhynchus nerka (Ozette Lake sockeye salmon)
Oncorhynchus tshawytscha (California Central Valley chinook salmon)
Oncorhynchus tshawytscha (California Coastal chinook salmon)
Oncorhynchus tshawytscha (Lower Columbia River chinook)
Oncorhynchus tshawytscha (Puget Sound chinook)
Oncorhynchus tshawytscha (Snake River fall run chinook salmon)
Oncorhynchus tshawytscha (Snake River spring/summer run chinook salmon)
Oncorhynchus tshawytscha (Southern Oregon/Coastal California chinook)
Oncorhynchus tshawytscha (Upper Willamette River chinook)
Pogonichtys macrolepidotus (Sacramento River split tail)
Salvelinus confluentus (Columbia River bull trout Distinct Population Segment)
Salvelinus confluentus (Klamath River bull trout Distinct Population Segment)
Salvelinus confluentus (Puget Sounds bull trout Distinct Population Segment)
Other Fish Species
Eucyclogobius newberryi (Tidewater goby)
Hypomesus transpacificus (Delta smelt)

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	Not at High Risk Under Any Alternative	Insufficient Information to Determine Risk	High Risk		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Managemen Under Alt. 3
FUNGI					
Acanthophysium farlowii			✓		
Albatrellus avellaneus			✓		
Albatrellus caeruleoporus			✓		
Albatrellus ellisii				✓	
Albatrellus flettii				✓	
Alpova alexsmithii			✓		
Alpova olivaceotinctus			✓		
Arcangeliella camphorata			✓		
Arcangeliella crassa			✓		
Arcangeliella lactarioides			✓		
Asterophora lycoperdoides			✓		
Asterophora parasitica			✓		
Baeospora myriadophylla			✓		
Balsamia nigrens			✓		
Boletus haematinus			✓		
Boletus pulcherrimus			✓		
Bondarzewia mesenterica	✓				
Bridgeoporus nobilissimus			✓		
Cantharellus subalbidus	✓				
Catathelasma ventricosa			✓		
Chalciporus piperatus	✓				
Chamonixia caespitosa			✓		
Choiromyces alveolatus			✓		
Choiromyces venosus			✓		
Chroogomphus loculatus			✓		
Chrysomphalina grossula			✓		
Clavariadelphus ligula				✓	
Clavariadelphus occidentalis				✓	
Clavariadelphus sachalinensis				✓	
Clavariadelphus subfastigiatus			✓		
Clavariadelphus truncatus	✓				
Clavulina castanopes v. *lignicola*			✓		
Clitocybe senilis			✓		
Clitocybe subditopoda			✓		
Collybia bakerensis	✓				
Collybia racemosa			✓		
Cordyceps ophioglossoides			✓		
Cortinarius barlowensis				✓	
Cortinarius boulderensis			✓		
Cortinarius cyanites			✓		

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	Not at High Risk Under Any Alternative	Insufficient Information to Determine Risk	High Risk		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
Cortinarius depauperatus			✓		
Cortinarius magnivelatus			✓		
Cortinarius olympianus			✓		
Cortinarius speciosissimus			✓		
Cortinarius tabularis		✓			
Cortinarius umidicola			✓		
Cortinarius valgus			✓		
Cortinarius variipes			✓		
Cortinarius verrucisporus			✓		
Cortinarius wiebeae			✓		
Craterellus tubaeformis	✓				
Cudonia monticola				✓	
Cyphellostereum laeve			✓		
Dermocybe humboldtensis			✓		
Destuntzia fusca			✓		
Destuntzia rubra			✓		
Dichostereum boreale			✓		
Elaphomyces anthracinus			✓		
Elaphomyces subviscidus			✓		
Endogone acrogena			✓		
Endogone oregonensis			✓		
Entoloma nitidum			✓		
Fayodia bisphaerigera			✓		
Fevansia aurantiaca			✓		
Galerina atkinsoniana	✓				
Galerina cerina			✓		
Galerina heterocystis				✓	
Galerina sphagnicola		✓			
Gastroboletus imbellus			✓		
Gastroboletus ruber			✓		
Gastroboletus subalpinus	✓				
Gastroboletus turbinatus			✓		
Gastroboletus vividus			✓		
Gastrosuillus amaranthii		✓			
Gastrosuillus umbrinus			✓		
Gautieria magnicellaris			✓		
Gautieria otthii			✓		
Gelatinodiscus flavidus			✓		
Glomus radiatum			✓		
Gomphus bonarii				✓	
Gomphus clavatus				✓	✓

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	Not at High Risk Under Any Alternative	Insufficient Information to Determine Risk	High Risk		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
Gomphus kauffmanii				✓	
Gymnomyces abietis			✓		
Gymnomyces nondistincta			✓		
Gymnopilus punctifolius				✓	
Gyromitra californica				✓	
Hebeloma olympianum			✓		
Helvella crassitunicata			✓		
Helvella elastica	✓				
Hydnotrya inordinata			✓		
Hydnotrya subnix			✓		
Hydropus marginellus			✓		
Hygrophorus caeruleus			✓		
Hygrophorus karstenii			✓		
Hygrophorus vernalis			✓		
Hypomyces luteovirens			✓		
Leucogaster citrinus				✓	
Leucogaster microsporus			✓		
Macowanites chlorinosmus			✓		
Macowanites lymanensis			✓		
Macowanites mollis			✓		
Marasmius applanatipes			✓		
Martellia fragrans			✓		
Martellia idahoensis			✓		
Mycena hudsoniana			✓		
Mycena overholtsii	✓				
Mycena quinaultensis			✓		
Mycena tenax			✓		
Mythicomyces corneipes			✓		
Neolentinus adhaerens			✓		
Neolentinus kauffmanii			✓		
Nivatogastrium nubigenum,	✓				
Octavianina cyanescens			✓		
Octavianina macrospora			✓		
Octavianina papyracea			✓		
Otidea leporina	✓				
Otidea smithii			✓		
Phaeocollybia attenuata				✓	✓
Phaeocollybia californica				✓	
Phaeocollybia dissiliens				✓	
Phaeocollybia fallax				✓	
Phaeocollybia gregaria			✓		

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	Not at High Risk Under Any Alternative	Insufficient Information to Determine Risk	High Risk		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
Phaeocollybia kauffmanii	✓				
Phaeocollybia olivacea				✓	✓
Phaeocollybia oregonensis				✓	
Phaeocollybia piceae				✓	
Phaeocollybia pseudofestiva				✓	
Phaeocollybia scatesiae				✓	
Phaeocollybia sipei				✓	
Phaeocollybia spadicea				✓	
Phellodon atratus			✓		
Pholiota albivelata			✓		
Podostroma alutaceum			✓		
Polyozellus multiplex				✓	
Pseudaleuria quinaultiana			✓		
Ramaria abietina			✓		
Ramaria amyloidea				✓	
Ramaria araiospora				✓	
Ramaria aurantiisiccescens				✓	
Ramaria botryis var. *aurantiiramosa*			✓		
Ramaria celerivirescens				✓	
Ramaria claviramulata			✓		
Ramaria concolor f. marrii		✓			
Ramaria concolor f. tsugina			✓		
Ramaria conjunctipes var. *sparsiramosa*			✓		
Ramaria coulterae			✓		
Ramaria cyaneigranosa				✓	
Ramaria gelatiniaurantia				✓	
Ramaria gracilis			✓		
Ramaria hilaris var. *olympiana*			✓		
Ramaria largentii				✓	
Ramaria lorithamnus		✓			
Ramaria maculatipes			✓		
Ramaria rainierensis			✓		
Ramaria rubella var. *blanda*			✓		
Ramaria rubribrunnescens			✓		
Ramaria rubrievanescens				✓	
Ramaria rubripermanens				✓	✓
Ramaria spinulosa var. *diminutiva*			✓		
Ramaria stuntzii				✓	
Ramaria suecica			✓		
Ramaria thiersii			✓		

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	**Not at High Risk Under Any Alternative**	**Insufficient Information to Determine Risk**	**High Risk**		
			Not Caused by Federal Action	**Caused by Management Under Alt. 2**	**Caused by Management Under Alt. 3**
Ramaria verlotensis			✓		
Rhizopogon abietis			✓		
Rhizopogon atroviolaceus			✓		
Rhizopogon brunneiniger			✓		
Rhizopogon chamaleontinus			✓		
Rhizopogon ellipsosporus			✓		
Rhizopogon evadens var. *subalpinus*			✓		
Rhizopogon exiguus			✓		
Rhizopogon flavofibrillosus			✓		
Rhizopogon inquinatus			✓		
Rhizopogon truncatus				✓	✓
Rhodocybe speciosa			✓		
Rickenella swartzii			✓		
Russula mustelina		✓			
Sarcodon fuscoindicus				✓	
Sedecula pulvinata			✓		
Sowerbyella rhenana				✓	
Sparassis crispa				✓	✓
Spathularia flavida				✓	
Stagnicola perplexa			✓		
Thaxterogaster pavelekii			✓		
Tremiscus helvelloides				✓	✓
Tricholoma venenatum		✓			
Tricholomopsis fulvescens			✓		
Tuber asa			✓		
Tuber pacificum			✓		
Tylopilus porphyrosporus			✓		
LICHENS					
Bryoria pseudocapillaris	✓[1]				
Bryoria spiralifera	✓[1]				
Bryoria subcana	✓[1]				
Buellia oidalea	✓[1]				
Calicium abietinum		✓			
Calicium adspersum		✓			
Cetrelia cetrarioides	✓				
Chaenotheca chrysocephala		✓			
Chaenotheca ferruginea		✓			
Chaenotheca furfuracea	✓				
Chaenotheca subroscida			✓		
Chaenothecopsis pusilla			✓		

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	Not at High Risk Under Any Alternative	Insufficient Information to Determine Risk	High Risk		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
Cladonia norvegica		✓			
Collema nigrescens	✓				
Dendriscocaulon intricatulum	✓				
Dermatocarpon luridum	✓				
Fuscopannaria saubinetii (syn. *Pannaria saubinetii*)			✓		
Heterodermia sitchensis		✓			
Hypogymnia duplicata	✓				
Hypogymnia vittata		✓			
Hypotrachyna revoluta			✓		
Leptogium burnetiae var. *hirsutum*		✓			
Leptogium cyanescens			✓		
Leptogium rivale	✓				
Leptogium teretiusculum			✓		
Lobaria linita	✓				
Lobaria oregana			✓		
Microcalicium arenarium		✓			
Nephroma bellum	✓				
Nephroma isidiosum		✓			
Nephroma occultum	✓				
Niebla cephalota			✓		
Pannaria rubiginosa	✓				
Peltigera pacifica	✓				
Platismatia lacunosa	✓				
Pseudocyphellaria perpetua		✓			
Pseudocyphellaria rainierensis	✓				
Ramalina thrausta				✓	
Stenocybe clavata		✓			
Teloschistes flavicans			✓		
Tholurna dissimilis		✓			
Usnea hesperina			✓		
Usnea longissima	✓				
BRYOPHYTES					
Brotherella roellii		✓			
Buxbaumia viridis	✓				
Diplophyllum plicatum	✓				
Herbertus aduncus		✓			
Iwatsukiella leucotricha	✓				
Kurzia makinoana		✓			
Marsupella emarginata v. aquatica	✓				
Orthodontium gracile	✓				

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	**Not at High Risk Under Any Alternative**	**Insufficient Information to Determine Risk**	**High Risk**		
			Not Caused by Federal Action	**Caused by Management Under Alt. 2**	**Caused by Management Under Alt. 3**
Ptilidium californicum	✓				
Racomitrium aquaticum		✓			
Rhizomnium nudum	✓[1]				
Schistostega pennata	✓				
Tetraphis geniculata				✓	
Tritomaria exsectiformis		✓			
Tritomaria quinquedentata		✓			
VERTEBRATES					
Larch Mountain salamander *Plethodon larselli*	✓				
Shasta salamander *Hydromantes shastae*	✓				
Siskiyou Mountains salamander *Plethodon stormi*	✓				
Van Dyke's salamander *Plethodon vandykei,*	✓				
Great Gray Owl *Strix nebulosa*	✓				
Oregon Red Tree Vole *Arborimus longicaudus*	✓				
MOLLUSKS					
Ancotrema voyanum	✓[1]				
Cryptomastix devia	✓				
Cryptomastix hendersoni	✓				
Deroceras hesperium	✓				
Fluminicola n. sp. 3	✓				
Fluminicola n. sp. 11	✓				
Fluminicola n. sp. 14	✓				
Fluminicola n. sp. 15	✓				
Fluminicola n. sp. 16	✓				
Fluminicola n. sp. 17	✓				
Fluminicola n. sp. 18	✓				
Fluminicola n. sp. 19	✓				
Fluminicola n. sp. 20	✓				
Fluminicola seminalis	✓				
Helminthoglypta talmadgei	✓[1]				
Hemphillia burringtoni	✓				
Hemphillia glandulosa	✓				
Hemphillia malonei	✓				
Hemphillia pantherina				✓	✓[2]
Juga (O) n. sp. 2	✓				
Juga (O) n. sp. 3	✓				

Table 3&4-10. Species Risk of Extirpation

TAXA GROUP *Species*	Not at High Risk Under Any Alternative	Insufficient Information to Determine Risk	High Risk		
			Not Caused by Federal Action	Caused by Management Under Alt. 2	Caused by Management Under Alt. 3
Lyogyrus n. sp. 1	✓[1]				
Lyogyrus n. sp. 2	✓				
Lyogyrus n. sp. 3	✓				
Megomphix hemphilli	✓[1]				
Monadenia chaceana	✓[1]				
Monadenia fidelis minor	✓[1]				
Monadenia infumata ochromphalus	✓[1]				
Monadenia troglodytes troglodytes	✓				
Monadenia troglodytes wintu	✓				
Oreohelix n. sp.	✓				
Pristoloma arcticum crateris	✓[1]				
Prophysaon coeruleum	✓				
Trilobopsis roperi	✓				
Trilobopsis tehamana	✓				
Vertigo n. sp.				✓	
Vespericola pressleyi				✓	
Vespericola shasta	✓				
Vorticifex n. sp. 1	✓				
VASCULAR PLANTS					
Arceuthobium tsugense mertensianae	✓				
Bensoniella oregana	✓				
Botrychium minganense	✓				
Botrychium montanum	✓				
Coptis asplenifolia	✓				
Coptis trifolia	✓				
Corydalis aquae-gelidae	✓				
Cypripedium fasciculatum	✓				
Cypripedium montanum	✓[1]				
Eucephalus vialis	✓				
Galium kamtschaticum	✓				
Platanthera orbiculata var. *orbiculata*	✓				
ARTHROPODS					
Canopy herbivores		✓			
Coarse wood chewers		✓			
Litter and soil dwelling species		✓			
Understory and forest gap herbivores		✓			

[1] While not at high risk of extirpation range wide in the Northwest Forest Plan area the species is at high risk of extirpation in a portion of it range. Mitigation could be added to reduce this risk.

[2] There is insufficient information to determine whether lack of pre-disturbance surveys in non-late-successional and non-old-growth stands under Alternative 3 poses a high risk of range-wide extirpation in the Northwest Forest Plan area because it is not known whether this species occurs in younger stands and the mechanisms that has allowed the sympatric species to persist in younger stands in the presence of various disturbances in the past are unknown.

Glossary

Acre - A land area measurement based on horizontal plane; 43,560 square feet; 1/640th of a square mile; approximately 4/10ths of a hectare; if square, nearly 209 feet on a side.

Adaptive management - A continuing process of action-based planning, monitoring, researching, evaluating, and adjusting with the objective of improving implementation and achieving the goals of the standards and guidelines (USDA, USDI 1994a).

Adaptive Management Areas - Land allocation under the Northwest Forest Plan; areas designated for development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives.

Administratively Withdrawn Areas - Areas removed from the suitable timber base through agency direction and land management plans.

Alternative - One of several policies, plans, or projects proposed for making decisions (USDA, USDI 1994a).

Amphibians - Cold-blooded vertebrates, including frogs, toads, salamanders, and newts, having four limbs and glandular skin, tied to moist or aquatic habitats for all or at least part of their life cycle.

Arthropods - Invertebrates belonging to the largest animal phylum (more than 800,000 species) including crustaceans, insects, centipedes, and arachnids. Characterized by a segmented body, jointed appendages, and an exoskeleton composed of chitin (USDA, USDI 1994a).

Assessment species - A Special Status Species Category established by Oregon/Washington BLM. Assessment species include plant and vertebrate species which are not presently eligible for official federal or state status but are of concern in Oregon or Washington and may, at a minimum, need protection or mitigation in BLM activities. These species will be considered as a level of special status species separate from Bureau sensitive.

Bryophytes - Plants of the phylum *Bryophyta*, including mosses, liverworts, and hornworts; characterized by the lack of true roots, stems, and leaves (USDA, USDI 1994a).

Candidate Species - Those plant and animal species that, in the opinion of the Fish and Wildlife Service (FWS) or NOAA Fisheries, may qualify for listing as endangered or threatened. The FWS recognizes two categories of candidates. Category 1 candidates are taxa for which the FWS has on file sufficient information to support proposals for listing. Category 2 candidates are taxa for which information available to the FWS indicates that proposing to list is possibly appropriate, but for which sufficient data are not currently available to support proposed rules.

Category - Groupings of species by relative rarity, practicality of pre-disturbance surveys, and information status. Management direction is generally the same for all species within a category and differs between categories.

Clearance surveys - See “Surveys Prior to Habitat-Disturbing Activities.”

Coarse woody debris - Portion of a tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter (USDA, USDI 1994a).

Congressionally Reserved Areas - Areas that require Congressional enactment for their establishment, such as National Parks, Wild and Scenic Rivers, National Recreation Areas, National Monuments, and Wilderness. Also referred to as Congressional Reserves (USDA, USDI 1994a). Includes similar areas established by Executive Order such as National Monuments.

Conservation Agreement - A formal written document agreed to by Fish and Wildlife Service and/or NOAA Fisheries and another federal agency, tribe, state agency, local government, or the private sector to achieve the conservation of candidate species through voluntary cooperation. It documents the specific actions and responsibilities for which each party agrees to be accountable. The objective of a Conservation Agreement is to reduce threats to a candidate species and/or its habitat. An effective Conservation Agreement may lower listing priority or eliminate the need to list a species.

Ecological amplitude - The breadth of the biological and environmental requirements of a species such as temperature, moisture, soil types, hosts, and stand ages.

Ecosystem approach - A strategy or plan to manage ecosystems to provide for all associated organisms, as opposed to a strategy or plan for managing individual species.

Effects - Effects, impacts, and consequences are synonymous. Effects may be direct, indirect, or cumulative and may fall in one of these categories: aesthetic, historic, cultural, economic, social, health, or ecological (such as effects on natural resources and on the components, structures, and functioning of affected ecosystems) (USDA USDI 1994a).

Endemic or endemism - Unique to a specific locality or the condition of being unique to a specific locality.

Endangered Species Act (ESA) - A law passed in 1973 to conserve species of wildlife and plants determined by the Director of the Fish and Wildlife Service or the NOAA Fisheries to be endangered or threatened with extinction in all or a significant portion of its range. Among other measures, ESA requires all federal agencies to conserve these species and consult with the Fish and Wildlife Service or NOAA Fisheries on federal actions that may affect these species or their designated critical habitat.

Environmental analysis - An analysis of alternative actions and their predictable short-term and long-term environmental effects, incorporating physical, biological, economic, and social considerations (USDA, USDI 1994a).

Environmental Impact Statement (EIS) - A statement of the environmental effects of a proposed action and alternatives to it. It is required for major federal actions under Section 102 of the National Environmental Policy Act (NEPA), and released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, the CEQ guidelines, and directives of the agency responsible for the project proposal.

Equivalent-effort surveys - Pre-disturbance surveys for species whose characteristics, such as small size or irregular fruiting, prevent it from being consistently located during site-specific surveys.

Extant - Still present in a specific locality.

Forest Ecosystem Management Assessment Team (FEMAT) - An interagency, interdisciplinary team of scientists, economists, and sociologists led by Dr. Jack Ward Thomas and chartered to review proposals for management of federal forests within the range of the northern spotted owl. The team produced a report assessing ten options in detail, which were used as a basis for developing the Northwest Forest Plan.

Fungi - Saprophytic and parasitic spore-producing organisms usually classified as plants that lack chlorophyll and include molds, rusts, mildews, smuts, mushrooms, and yeasts.

Habitat - Place or environment where a plant or animal naturally or normally lives and grows. For surveys - habitat specific to the species being surveyed, generally described in Survey Protocols or Management Recommendations.

Habitat Conservation Assessment - A comprehensive, state-of-knowledge technical document that describes life history, habitat requirements, and management considerations for a species or group of species throughout its/their occupied range on the lands managed by the cooperating agencies.

Habitat-disturbing activity - Activities with disturbances likely to have a substantial negative impact on the species habitat, its life cycle, microclimate, or life support requirements. See additional detail in the standards and guidelines.

High-priority sites - A site or group of sites deemed necessary for species persistence. High-priority sites may be identified as specific locations, sites meeting specific criteria, or as a distribution of populations or sites over a geographic area that may change over time. High-priority sites are designated through the Management Recommendations for the species. High-priority sites are generally a subset of known sites; however, in some cases, all known sites may be determined to be high-priority sites. Management of high-priority sites is necessary to ensure species persistence.

High Risk of Extirpation - Recognizing there is much that remains unknown about many of the species, the analysis in this SEIS concludes that there is a reasonable certainty the species are not likely to continue to exist in the Northwest Forest Plan area or in portions of the specie's range. In general terms, this is similar to the 2000 FEIS outcome of "Habitat (including known sites) is insufficient to support stable populations of the species" and the FEMAT definition of "Extirpation risk species - Those species that were generally ranked as having a medium-low or low viability over a 50-year period. Extirpation related to local extinction of a species from one or more National Forests within the range of the northern spotted owl."

Interagency Species Management System (ISMS) - An Agency database system that contains information about Survey and Manage species in the Northwest Forest Plan area, including known sites, species locations, and habitats.

Interdisciplinary team (ID team) - A group of individuals with varying areas of specialty assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze the problem and propose action.

Issue - A point, matter, or question of public discussion or interest to be addressed or decided through the planning process.

Known site - Historic and current location of a species reported by a credible source, available to field offices, and that does not require additional species verification or survey by the Agency to locate the species. Known sites include those known prior to the signing of the Northwest Forest Plan Record of Decision (USDA, USDI 1994b), as well as sites located in the future. Known sites can be based on any documented and credible source (such as herbaria/museum records, published documents, Agency records, species expert records, and documented public information). Historic locations where it can be demonstrated that the species and its habitat no longer occur do not have to be considered known sites. A credible source is a professional or amateur person who has academic training and/or demonstrated expertise in identification of the taxon of interest sufficient for the Agency to accept the identification as correct. These can include Agency staff and private individuals.

The known site identification should be precise enough to locate the species by geographic coordinates, maps, or descriptions sufficient to design specific management actions or to be located by other individuals. Also see "site" for description of size or components.

Land management - Intentional process of planning, organizing, programming, coordinating, directing, and controlling land use actions.

Land allocation - Commitment of a given area of land or a resource to one or more specific uses (such as campgrounds or Wilderness). In the Northwest Forest Plan, one of the seven allocations of Congressionally Withdrawn Areas, Late-Successional Reserves, Adaptive Management Areas, Managed Late-Successional Areas, Administratively Withdrawn Areas, Riparian Reserves, or Matrix.

Landscape - A heterogeneous land area with interacting ecosystems repeated in similar form throughout (USDA, USDI 1994a).

Late-successional forests - Forest stands consisting of trees, structural attributes, supporting biological communities, and processes associated with old-growth and/or mature forests (USDA, USDI 1994a). Forest seral stages that include mature and old-growth age classes (USDA, USDI 1994a). Age is not necessarily a defining characteristic but has been used as a proxy or indicator in some usages. Minimum ages are typically 80 to 130 years, more or less, depending on the site quality, species, rate of stand development, and other factors.

Late-Successional Reserve - Land allocation under the Northwest Forest Plan with the objective to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest related species, including the northern spotted owl. Limited stand management is permitted, subject to review by the Regional Ecosystem Office (USDA, USDI 1994b).

Lichens - Complex thallophytic plants comprised of an alga and a fungus growing in symbiotic association on a solid surface (such as a rock).

Line officer - In the BLM and Forest Service, the individual managers in the direct chain of command.

Manage (as in manage known sites) - To maintain the habitat elements needed to provide for persistence of the species at the site. Manage may range from maintaining one or more habitat components such as down logs or canopy cover, up to complete exclusion from disturbance for many acres, and may permit loss of some individuals, area, or elements not affecting continued site occupancy.

Managed Late-Successional Areas - Land allocation under the Northwest Forest Plan; similar to Late-Successional Reserves, but identified for certain owl territories in the drier provinces where regular and frequent fire is a natural part of the ecosystem. Certain silvicultural treatments and fire hazard reduction treatments are allowed to help prevent large-scale disturbance such as fires of high intensity or severity, disease, and insect epidemics.

Management Recommendation - An interagency document that addresses how to manage known sites and that provide guidance to Agency efforts in conserving Survey and Manage species. They describe the habitat parameters that provide for maintaining the taxon at that site. They may also identify high-priority sites for uncommon species or provide other information to support management direction. (See additional detail in the standards and guidelines.)

Matrix - Federal lands outside of reserves, withdrawn areas, Managed Late-Successional Areas, and Adaptive Management Areas (USDA, USDI 1994a).

Mature forest - A subset of late-successional forests. Mature forests are characterized by the onset of slowed height growth, crown expansion, heavier limbs, gaps, some mortality in larger trees, and appearance of more shade-tolerant species or additional crown layers. In Douglas-fir west of the Cascades, this stage typically begins between 80 and 130 years, depending on site conditions and stand history (adapted from USDA, USDI 1994b, pp. B-2 and B-3).

Microclimate - The suite of climatic conditions measured in localized areas near the earth's surface. Microclimate variables important to habitat may include temperature, light, wind speed, and moisture.

Mitigation measures - Modifications of actions taken to: (1) avoid impacts by not taking a certain action or parts of an action; (2) minimize impacts by limiting the degree or magnitude of the action and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or, (5) compensate for impacts by replacing or providing substitute resources or environments (USDA, USDI 1994a).

Mollusks - Invertebrate animals (such as slugs, snails, clams, or squids) that have a soft unsegmented body usually enclosed in a calcareous shell.

Monitoring - A process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned (USDA, USDI 1994a).

National Environmental Policy Act (NEPA) - An Act passed in 1969 to declare a National policy that encourages productive and enjoyable harmony between humankind and the environment, promotes efforts that prevent or eliminate damage to the environment and biosphere, stimulates the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the nation, and establishes a Council on Environmental Quality (USDA, USDI 1994a).

National Forest Management Act (NFMA) - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring preparation of Forest Plans and the preparation of regulations to guide that development (USDA, USDI 1994a).

Non-vertebrate species - A species that does not have a backbone.

Northwest Forest Plan - Coordinated ecosystem management direction incorporated into land and resource management plans for lands administered by the BLM and the Forest Service within the range of the northern spotted owl. In April 1993, President Clinton directed his cabinet to craft a balanced, comprehensive, and long-term policy for management of over 24 million acres of public land within the range of the northern spotted owl. A Forest Ecosystem Management Assessment Team (FEMAT) was chartered to develop a series of options. These options were modified in response to public comment and additional analysis and then analyzed in a Final Supplemental Environmental Impact Statement (USDA, USDI 1994a). A Record of Decision was signed on April 13, 1994, by the Secretaries of the Department of Agriculture and the Department of Interior to adopt Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (USDA, USDI 1994b). The Record of Decision, including the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl is referred to as the "Northwest Forest Plan." The Northwest Forest Plan is not a "plan" in the agency planning regulations sense; the term instead refers collectively to the 1994 amendment to existing agency land and resource management plans or to the specific standards and guidelines for late-successional species incorporated into subsequent land and resource management plans.

Old-growth forest - An ecosystem distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics which may include tree size, accumulations of large dead woody material, number of canopy layers, species, composition, and ecosystem function. More specific parameters applicable to various species are available in the 1993 Interim Old Growth Definitions (USDA Forest Service Region 6). The Northwest Forest Plan SEIS and FEMAT describe old-growth forest as a forest stand usually at least 180 to 220 years old with moderate-to-high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees;

high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground (USDA, USDI 1994a).

Outcome - A reasoned determination of a species' likely future population stability and distribution pattern, based on a comparison of the species' reference distribution to current conditions and to estimated conditions projected to occur following implementation of the standards and guidelines. The four potential outcomes that are used to inform management decisions are:

Outcome 1: Habitat (including known sites) is of sufficient quality, abundance, and distribution to allow species to stabilize in a pattern similar to reference distribution.
Outcome 2: Habitat (including known sites) is of sufficient quality, abundance, and distribution to allow species to stabilize in a pattern altered from reference distribution with some limitations on biological functions and species interactions.
Outcome 3: Habitat (including known sites) is insufficient to support stable populations of the species.
Outcome 4: Information is insufficient to determine an outcome.

The Oregon Natural Heritage Information Center - ONHIC is part of the Oregon State University Institute for Natural Resources, in the Research Office. Their mission is to identify the plant, animal, and ecological community resources of Oregon. As part of the Natural Heritage Network and NatureServe, the Oregon Natural Heritage Information Center contributes to an understanding of global biodiversity and provides tools for managers and the public to better protect vanishing species and communities.

Oregon Natural Heritage Program - The Oregon Natural Heritage Program is a cooperative, interagency effort to identify the plant, animal, and plant community resources of Oregon. The program is managed by the Oregon Natural Heritage Information Center, part of the Oregon State University's Institute for Natural Resources, under a cooperative agreement with the Oregon Division of State Lands. The Natural Heritage Program was established by the Oregon Natural Heritage Act, and is overseen by the Natural Heritage Advisory Council, a board appointed by the Governor.

Persistence (as in persistence objective for a species) An abbreviated expression of the species management objectives for these standards and guidelines. Generally the persistence objective for vertebrates is based on the Forest Service viability provision in the regulations implementing NFMA. For non-vertebrates, it is a similar standard to the extent practicable. See "Species Persistence Objective" in these standards and guidelines for more details. Use in standards and guidelines such as "...sites not needed for persistence" includes an understood "reasonable assurance of" or "to the extent practicable."

Persistence (as in persistence at a site) - Continued occupancy by a species at a known site.

Physiographic province - A geographic area having a similar set of biophysical characteristics and processes due to effects of climate and geology that result in patterns of soils and broad-scale plant communities. Habitat patterns, wildlife distributions, and historical land use patterns may differ significantly from those of adjacent provinces (USDA, USDI 1994a) (See Figure 1 in the standards and guidelines).

Planning area - All of the lands within a federal agency's management boundary addressed in land management plans (USDA, USDI 1994a).

Practical surveys (relative to surveys prior to habitat-disturbing activities) - Surveys are practical if characteristics of the species (such as size, regular fruiting) and identifying features result in being able to reliably locate the species, if the species is present, within one or two field seasons and with a reasonable level of effort. Characteristics determining practicality of

surveys include: individual species must be of sufficient size to be detectable; the species must be readily distinguishable in the field or with no more than simple laboratory or office examination for verification of identification; the species is recognizable, annually or predictably producing identifying structures; and the surveys must not pose a health or safety risk. See additional detail in the standards and guidelines.

Pre-disturbance surveys - See "Surveys Prior to Habitat-Disturbing Activities."

Pre-project clearances - activities conducted to learn whether a species is present or potentially present in a geographic area. Pre-project clearances include, but are not limited to, clearance surveys, pre-disturbance surveys, field clearances, field reconnaissance, inventories, habitat examinations, habitat evaluation, and review of existing survey records. They are completed prior to habitat-disturbing activities to determine the presence of a species or its habitat and the effect of management actions on the species.

Prescribed fire - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Proposed species - Any plant or animal species that is proposed by the Fish and Wildlife Service or NOAA Fisheries in a Federal Register notice to be listed as threatened or endangered.

Proposive surveys - One type of landscape-scale or strategic survey, proposive surveys are focused searches conducted where taxa experts anticipate finding the target species. They are used to find sites of the rarest species, i.e. those that may not be picked up in random plots. Also referred to as purposive surveys.

Purposive surveys - See "Proposive surveys."

Range of the Northern Spotted Owl - Area generally comprised of lands in western portions of Washington, Oregon, and northern California (see Province Map, Figure 1) (USDA, USDI 1994a).

Rare - A species is considered to be rare when: there are a low number of extant known sites with low numbers of individuals present at each site and populations are not well-distributed within its natural range. "Low" numbers and "not well distributed" are relative terms that must be considered in the context of other criteria such as distribution of habitat, fecundity, and so forth. See complete list of criteria under "Relative Rarity" in the standards and guidelines.

Record (as applied in the ISMS database) - A single database entry. There may be more than one record for a single location because the location was visited multiple times, the visit record was recorded more than once by multiple observers, or voucher specimens from the location were stored in several different locations.

Record of Decision - A document separate from, but associated with, an environmental impact statement that: (1) states the management decision; (2) states the reason for that decision, (3) identifies all alternatives including the environmentally preferable and selected alternatives; and (4) states whether all practicable measures to avoid environmental harm from the selected alternative have been adopted, and if not, why not (USDA, USDI 1994a).

Reference distribution - Historic or inferred biological distribution pattern of a species (limited by historic potential) that serves as a baseline to compare current and future distribution. For purposes of this analysis, the reference distribution is considered to be "well distributed."

Regional Ecosystem Office (REO) - The office that provides staff work and support to facilitate decision making of the Regional Interagency Executive Committee (RIEC) and to prompt interagency issue resolution in support of implementing the Northwest Forest Plan Standards and Guidelines. The REO is also responsible for evaluating major modifications arising from the adaptive management process and coordinating the formulation and implementation of

data standards. This office reports to the RIEC and is responsible for developing, evaluating, and resolving consistency and implementation issues with respect to specific topics under the Northwest Forest Plan (USDA, USDI 1994b).

Regional Interagency Executive Committee (RIEC) - This group consists of the Pacific Northwest federal agency heads of the Forest Service, BLM, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Bureau of Indian Affairs, Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Geological Survey (Biological Resource Division), Natural Resources Conservation Service, and the National Park Service. The RIEC serves as the senior regional entity to assure prompt, coordinated, and successful implementation of the Northwest Forest Plan Standards and Guidelines.

Reserves - Congressionally Reserved Areas (such as Wilderness) and land allocations that were designated under the Northwest Forest Plan, including Late-Successional Reserves, Riparian Reserves, and Managed Late-Successional Areas. Reserves help to protect and enhance conditions of late-successional and old-growth forest ecosystems. Stand management actions are either prohibited or limited within these allocations. The likelihood of maintaining a connected viable late-successional ecosystem was found to be directly related to the amount of late-successional forest in reserve status.

Riparian Reserves - Areas along live and intermittent streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. Riparian Reserves are important to the terrestrial ecosystem as well, serving as dispersal habitat for certain terrestrial species (USDA, USDI 1994b).

Sensitive species - Those species that: (1) have appeared in the Federal Register as proposed for classification and are under consideration for official listing as endangered or threatened species; (2) are on an official state list; or, (3) are recognized by the implementing agencies as needing special management to prevent their being placed on federal or state lists (USDA, USDI 1994a).

Seral stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage (USDA, USDI 1994a).

Site (as in occupied site) - The location where a specimen or population of the target species (taxonomic entity) was located, observed, or presumed to exist (occasionally used as a local option to pre-disturbance surveys for certain vertebrates) based on indicators described in the Survey Protocol or Management Recommendation. Also, the polygon described by connecting nearby or functionally contiguous detections at the same location.

Site (as used in manage known sites) - The occupied site plus any buffer needed to maintain the habitat parameters described in the Management Recommendation.

South range (for arthropods) - The California Coast Range, the Oregon and California Klamath, and the California Cascades Physiographic Provinces (USDA, USDI 1994a, p. J-2 37).

Species - A class of individuals having some common characteristics or qualities. In these standards and guidelines, synonymous with taxon, which may include subspecies, groups, or guilds.

Special Status Species - As used in this SEIS, the term "Special Status Species" refers only to the following species categories that are included under agency species conservation policies:

> Oregon/Washington BLM: Bureau Tracking, Bureau Assessment, and Bureau Sensitive (BLM Manual 6840; Instruction Memorandum No. OR-2003-054; Instruction Memorandum No. OR-91-57).

California BLM: Bureau Sensitive (BLM Manual 6840; Manual Supplement 6840.06, Plant Management).

Forest Service Region 5: Sensitive (Forest Service Manual 2670).

Forest Service Region 6: Sensitive (Forest Service Manual 2670).

Stable - A taxon that, over time, maintains population numbers, given inherent levels of population fluctuation and variability of habitats to which they are adapted. The species may become stable at a different population level than the current or (inferred) historical level.

Stand (tree stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition to be distinguishable from the forest in adjoining areas (USDA, USDI 1994a).

Standards and guidelines - The rules and limits governing actions, as well as the principles specifying the environmental conditions or levels to be achieved and maintained (USDA, USDI 1994a).

Strategic surveys - Landscape-scale surveys designed to collect information about a species, including its presence and habitat.

Substrate - Any object or material on which an organism grows or is attached (USDA, USDI 1994a).

Succession - A series of dynamic changes by which one group of organisms succeeds another through stages leading to a potential natural community or climax. An example is development of a series of plant communities (called seral stages) following a major disturbance (USDA, USDI 1994a).

Supplemental Environmental Impact Statement (SEIS) - As defined by the NEPA, a supplement to an existing Environmental Impact Statement is prepared when: (1) the agency makes substantial changes to the proposed action that are relevant to environmental concerns; (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; or, (3) the agency determines that the purposes of NEPA would be furthered by doing so.

Survey and Manage - Mitigation measure adopted as a set of standards and guidelines within the Northwest Forest Plan Record of Decision and replaced with standards and guidelines in 2001 (Record of Decision) intended to mitigate impacts of land management efforts on those species that are closely associated with late-successional or old-growth forests whose long-term persistence is a concern. This mitigation measure applies to all land allocations and requires land managers to take certain actions relative to species of plants and animals, particularly some amphibians, bryophytes, lichens, mollusks, vascular plants, fungi, and arthropods, which are rare or about which little is known. These actions include: (1) manage known sites; (2) survey prior to habitat-disturbing activities; and, (3) conduct extensive and general regional (strategic) surveys.

Survey Protocol - Unless otherwise specified, Survey Protocols are for surveys prior to habitat-disturbing activities. These are interagency documents describing the survey techniques needed to have a reasonable chance of locating the species when it is present on the site, or needed to make an "equivalent-effort" of locating the species when it is present on the site. Survey Protocols also identify habitats needing surveys and may identify habitats or circumstances not needing surveys. Instructions for conducting strategic surveys may be prepared along with the Strategic Survey Implementation Guide and may be referred to as strategic survey protocols.

Surveys Prior to Habitat-Disturbing Activities - Surveys conducted to determine if the species is present at a site proposed for habitat-disturbing activities. Includes "practical surveys" and "equivalent-effort surveys." See additional detail in the standards and guidelines.

Taxon - A category in the scientific classification system, such as a class, family, phylum, species, subspecies, or race.

Taxonomic entity - A unique species, subspecies, or variety.

Threatened species - Plant or animal species likely to become endangered throughout all or a significant portion of its range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register (USDA, USDI 1994a).

Tracking species - A special status species category established by Oregon/Washington BLM. The purpose of tracking species is to enable an early warning for species which may become threatened or endangered in the future. BLM Districts in Oregon and Washington are encouraged to collect occurrence data on species for which more information is needed to determine status within the state or which no longer need active management. Until status of such species changes to federal or state listed, candidate of assessment species, tracking species will not be considered as special status species for management purposes.

Uncommon (species) - Species that do not meet the definition for rare, but where concerns for persistence remain. See criteria under "Relative Rarity" in the standards and guidelines.

Understory - The trees and other woody species growing under the canopies of larger adjacent trees and other woody growth (USDA, USDI 1994a).

Vascular plants - Plants that contain conducting or vascular tissue. They include seed-bearing plants (flowering plants and trees) and spore-bearing plants (ferns, horsetails, and clubmosses).

Vertebrate species - A species that has a backbone or spinal column (includes fishes, amphibians, reptiles, birds, and mammals, all of which have a segmented bony or cartilaginous spinal column).

Viability - Ability of a wildlife or plant population to maintain sufficient size to persist over time in spite of normal fluctuations in numbers, usually expressed as a probability of maintaining a specific population for a specified period (USDA, USDI 1994a).

Viability Provision - A provision contained in the National Forest System Land and Resource Management Planning Regulation of 1982, pursuant to the National Forest Management Act. This provision is found in 36 CFR 219.19 and reads as follows: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area."

Viable population - A wildlife or plant population that contains an adequate number of reproductive individuals appropriately distributed on the planning area to ensure the long-term existence of the species (USDA, USDI 1994a).

Well distributed - Distribution sufficient to permit normal biological function and species interactions, considering life history characteristics of the species and the habitats for which it is specifically adapted.

Wilderness - Areas designated by Congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or for a primitive and confined type of recreation; include at least 5,000 acres or are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecological and geologic interest (USDA, USDI 1994a).

Wildland fire - Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland fire for resource benefits - A fire that results from natural ignition (i.e. lightning strike) and is permitted to burn because it is resulting in resource benefits, is consistent with the land and resource management plan, is consistent with the fire management plan, and is burning within prescription.

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List of Preparers

Following is a list of contributors to this Supplemental Environmental Impact Statement To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines.

EIS Core Team

Anne Boeder - *Assistant Effects Writer.* Anne holds a B.A. in Cartography and Geography from the University of Wisconsin and a Master of Public Administration from the University of Utah. Anne has 19 years of government service including 13 years with the Forest Service and 4 years with the BLM. She currently serves as the Roseburg BLM Coordinator for the Little River Adaptive Management Area.

Ken Denton - *Implementation Specialist.* Ken served on the interdisciplinary teams for the Northwest Forest Plan SEIS (1994), the Forest Service EIS for the Northern Spotted Owl (1992), and the Survey and Manage SEIS (2000). As Regional Silviculturist for the Forest Service in Region 6 and member of the Regional Ecosystem Office Late-Successional Reserve Work Group, he has helped implement the Northwest Forest Plan since 1994. He has 33 years experience with the Forest Service and has worked on five National Forests in California, Idaho, and Oregon in silviculture and planning. He has also served as a District Ranger. He holds a B.S. in Natural Resources from Humboldt State University.

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Chris Foster - *Biologist.* Chris is currently the District Wildlife Biologist for the Roseburg BLM District. He holds a B.S. in Forest and Wildlife Management from the University of Maine, and an M.S. in Wildlife Management from West Virginia University. Chris has more than 15 years experience working for the Forest Service and the BLM. Chris has held positions as a Wildlife Biologist and as a Forester specializing in watershed analysis and planning.

Phil Hall - *Lead Effects Writer.* Phil holds a B.S. in Forestry and a B.S. in Conservation from North Carolina State University. He served on the interdisciplinary team for the Northwest Forest Plan SEIS (1994) and was a lead planner in developing the western Oregon resource management plans tiered to the Northwest Forest Plan. He has served on regional teams for the development of watershed analysis guides and monitoring and research. He has provided national level training for the National Environmental Policy Act and Resource Management Planning. Phil has a broad understanding and familiarity of BLM programs and plans, including the Northwest Forest Plan and environmental impact statements. He has 30 years of federal service. Phil has been with the BLM since 1976 and has worked on two BLM Districts, and several resource areas. He has served on special assignments to the Washington Office and to other BLM Districts in the western United States.

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Dick Prather - *Team Leader.* Dick is a 1968 graduate of the Northern Arizona University School of Forestry in Flagstaff, Arizona. He was the team leader for the Final SEIS for Survey and

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Craig Snider - *Planner/NEPA Specialist.* Craig holds a B.S. in Forestry from the University of California, Berkeley and a M.A in Spirituality from Holy Names College. Craig has 23 years experience with the Forest Service including work on the Idaho Panhandle, Targhee, Dixie, Siskiyou, and Siuslaw National Forests. In recent years, he has served on the Regional Implementation Monitoring Team for the Northwest Forest Plan and as the Regional Environmental Coordinator for Region 6, Forest Service. He is also a Certified Silviculturist and a graduate of the Forest Engineering Institute at Oregon State University. He has held field positions of forester, silviculturist, and timber management assistant. He is currently the Forest Planner and Program Manager for inventory, monitoring, and planning on the Siuslaw National Forest in Corvallis.

Specialists

Chris Cadwell - *Forester/Resource Analyst.* Chris served on FEMAT in the estimation of Probable Sale Quantities. He has coordinated PSQ estimations and GIS analysis supporting development and implementation of the BLM resource management plans in western Oregon. He is co-author of the implementation guidance for the 15 percent standard and guideline. Chris served as co-lead in developing interagency vegetation standards and served on the team which developed interagency land allocation standards for the Northwest Forest Plan area. Chris has 22 years experience with the BLM in western Oregon and currently is employed by the BLM Oregon/ Washington State Office. He holds a B.S. in Forest Management from Humboldt State University.

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Distribution List and Document Availability on the Internet

This Draft Supplemental Environmental Impact Statement (SEIS) is being sent to the following individuals, groups, and organizations. The list includes elected officials; federal agencies; state, local, and county governments; American Indian Tribes and Nations; businesses; other organizations; libraries; and individuals.

The Draft SEIS will also be available on the internet at: http://www.or.blm.gov/nwfpnepa.

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Bureau of Land Management, OR/WA
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Office of the Governor, State of Oregon
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U.S. Geological Survey
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National Marine Fisheries Service
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Representative of Washington Counties
Rocky McVay
Association of O & C Counties
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California Resources Agency
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Environmental Protection Agency
Michael Pool
Bureau of Land Management, CA
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Environmental Protection Agency
Tom Quigley
USDA Forest Service, PNW

George Smith
- Intertribal Timber Council

Stan M. Speaks
- Bureau of Indian Affairs

John Woolley
- Representative of California Counties

Federal Agencies

Advisory Council on Historic Preservation
Bonneville Power Administration
Environmental Protection Agency
- Environmental Resources Center
- Geographic Implementation Unit
- Operations Office
- Region 9
- Region 10

Federal Aviation Administration
Federal Energy Regulatory Commission
Klamath Soil & Water Conservation
Portland Federal Executive Board
Regional Ecosystem Office
U.S. Army
U.S. Coast Guard
U.S. Department of Agriculture
- Animal and Plant Health Inspection Service
- Enviromental Coordinator of Ecological Services
- Forest Service
  - Pacific Northwest Regional Office
  - Pacific Southwest Regional Office
  - Pacific Northwest Research Station
  - Pacific Southwest Research Station
  - *California*
  - Klamath National Forest
  - Lassen National Forest
  - Mendocino National Forest
  - Modoc National Forest
  - Shasta-Trinity National Forest
  - Six Rivers National Forest
  - *Oregon*
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  - Mt. Hood National Forest
  - Rogue River National Forest
  - Siskiyou National Forest
  - Siuslaw National Forest
  - Umpqua National Forest
  - Willamette National Forest
  - Winema National Forest
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  - Seattle District
  - Walla Walla District
- Naval Submarine Base Bangor

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U.S. Department of Interior
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- Bureau of Land Management
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  - Redding Field Office
  - Ukiah Field Office
  - *Oregon*
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  - Eugene District
  - Lakeview District
  - Medford District
  - Roseburg District
  - Salem District
- Burea of Reclamation
- National Park Service
  - Ft. Vancouver National Historic Site
  - Olympic National Park
  - Pacific Northwest Region
  - Redwood National Park
- Office of Environmental Policy & Compliance
- Office of the Regional Solicitor
- Office of the Secretary
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
  - Biological Resources Division
  - Pacific Northwest District

U.S. Department of Justice
U.S. Ecosystem Restoration Office
U.S. Housing and Urban Development
U.S. Small Business Administration
U.S. Department of Transportation
- Western Federal Lands Highway Division
- Federal Highway Administration
  - Oregon Division
  - Western Division

State, County, and Local Governments

California
State of California
- Caltrans
- Department of Forestry
- Department of Forestry and Fire Protection
- Department of Water Resources
- Fish and Game Commission
- Lands Commision

- Office of the Governor
- Parks and Recreation
- Resources Agency
- State Clearinghouse

California Regional Water Quality
City of Yreka
Colusa County, Agriculture Department
Del Norte County Board of County Supervisors
Eel - Russian River Commission
Glenn County
- Agriculture Department
- Board of Directors
- Board of Supervisors
- Coop Extension Office
- Planning Department

Humboldt County Board of Supervisors
Lake County Board of Supervisors
Mendocino County
- Board of Supervisors
- Cooperative Extension
- Planning Department
- Water Agency

North California Water Association
Pinecrest Permittees Association
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- Administrators
- Board of Supervisors

Sonoma County Conservation Action
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- Board of Supervisors
- Planning Department

Trinity County Board of County Supervisors

Colorado
San Miguel County

District of Columbia
Rural Utilities Service

Oregon
State of Oregon
- Department of Agriculture
- Department of Energy
- Department of Environmental Quality
- Department of Fish & Wildlife
- Department of Forestry
- Department of Geology and Mineral Industries
- Department of Human Resources
- Department of Revenue
- Department of Transportation
- Employment Department
- Executive Department
- Farm Bureau Federation
- Historic Preservation Office
- Marine Board
- Office of the Governor
- Parks and Recreation
- Police
- Public Interest Research Group
- Small Business Administration
- Water Resources Department

Association of O&C Counties
Association of Oregon Counties
City of Cottage Grove
City of Eugene, Parks and Recreation District
City of Klamath Falls
Coos County Board of Commissioners
Curry County Board of Commissioners
District 17 Watermaster
Douglas County
- Board of Commissioners
- Natural Resources Conservation Service
- Planning Department

Hood River County
Jackson County Commissioners
Jefferson County Commissioners
Josephine County
- Courthouse
- Forestry Department
- Planning Department

Klamath Basin Water Resources Advisory Committee
Klamath County
Klamath County Commissioners
Klamath Irrigation District
Lake County
Lane County Commissioners
Meadows Drainage District
Mohawk Watershed Planning Group
Northwest Power Planning Council
Portland Chamber of Commerce
Portland Water Bureau
Rogue Institute of Economy and Ecology
Rogue Valley Council of Governments
Southeastern Oregon Advisory Council
Umpqua Regional Council of Governments
Wasco County Commissioners

Washington
State of Washington
- Department of Ecology
- Department of Fish and Wildlife
- Department of Natural Resources
- Department of Transportation
- Executive Policy Office
- Office of the Governor

Chelan County Planning Department
City of Port Townsend
Clallam County Commisioner
Forks Chamber of Commerce
Jefferson County Commissioners
Lewis County Commissioners
Mason County Commissioner

Skagit County
Skamania County Planning Department
Washington State Association of Counties

American Indian Tribes and Nations

Big Valley Rancheria
Blue Lake Rancheria
Columbia River Inter-Tribal Fish Commission
Colville Confederated Tribes
Colville Tribal Office
Confederated Tribes of Grande Ronde Indians
Confederated Tribes of Siletz Indians of Oregon
Confederated Tribes of The Chehalis Reservation
Confederated Tribes of The Warm Springs Reservation of Oregon
Coquille Indian Tribe
Covelo Indian Community
Cow Creek Band of Umpqua Tribe of Indians
Cowlitz Indian Tribe
Cowlitz Wahkiakum Council of Government
Coyote Valley Rancheria
Elk Valley Rancheria
Grindstone Rancheria
Hoh Tribe
Hoopa Tribal Fisheries Department
Hoopa Valley Tribal Council
Intertribal Timber Council
Jamestown S'klallam Tribe
Kalapooya Sacred Circle Alliance
Karuk Tribe of California
Klamath General Council
Klamath Indian Game Commission
Lower Elwha S'klallam Tribe
Lummi Indian Business Council
Lummi Tribe of The Lummi Reservation
Makah Tribe
Muckleshoot Indian Tribal Council
Native American Heritage Committee
Native American Program Oregon Legal Services
Nisqually Indian Community Council
Nooksack Indian Tribal Council
Northwest Indian Fisheries Commission
Paskenta Band of The Nomlaki
Point-No-Point Treaty Council
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Puyallup Tribal Council
Quinault Indian Nation
Resighini Rancheria
Robinson Rancheria Pomo Indian Tribe
Rohnerville Rancheria
Round Valley Indian Tribes
Samish Indian Tribe
Sauk Suiattle Indian Tribal Council
Shasta Nation
Shoalwater Bay Tribal Council
Siletz Tribal Council
Snohomish Tribe
Squaxin Island Tribal Council
Stillaguamish Board of Directors
Suquamish Tribal Council
Swinomish Indian Tribal Community
Table Bluff Reservation
The Klamath Tribes
Tolowa Nation
Tsnungwe Council
Tulalip Board of Directors
Twin Rocks Inholders
Upper Lake Rancheria
Upper Skagit Indian Tribal Council
Yakama Indian Nation Tribal Council
Yurok Tribe

Businesses

Adobe Rose
Alder Creek Lumber Co.
Alpha World International Corp.
American Forest and Paper Assn.
American Forest Resource Council
American Forestry Association
American Rivers, Inc.
Amerititle
Armco
Associated Oregon Industries
Associated Oregon Loggers
Avison Lumber Co.
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B.S. Roads, Inc.
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Klamath Potato Growers Association
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Laughing Horse Book Store
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Lee Enterprises
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Logging Engineering Int., Inc.
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Salt Springs Logging
Saltman and Stevens, P.C.
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Swanson Group
Swanson Superior Forest Product, Inc.
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Washington Belt & Drive Systems
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Washington Forest Law Center
Westbrook Land and Timber
Western Forest Protection Association
Western Timber Co.
Western Wood Products Association
Westest Logging
Weyerhauser Co.
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Wolfe's Guide Service
Woody Contracting, Inc.
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Other Organizations

1000 Friends of Oregon
1000 Friends of The Earth
Alameda Creek Alliance
Allegheny Defense Project
Alpine Lakes Protection Society
American Alpine Institute
American Fisheries Society
American Lands
American Lands Alliance
Ancient Forest Defense Fund
Applegate Partnership
Applegate River Watershed Council
Arc-En-Ciel
Association of Northwest Steelheaders
Association of Oregon Counties
Audubon Society
- Altacal
- Black Hills
- Columbia Gorge
- Corvallis
- Golden Gate
- Grays Harbor
- Kalmiopsis
- Kitsap
- Kittitas
- Klamath Basin
- Leavenworth
- National
- N. Central Washington
- Pilchuck
- Portland
- Rainier
- Redwood Chapter
- Rogue Valley
- San Juan Islands
- Seattle
- Siskiyou
- Spokane
- Umpqua Valley

Bark
Baron Family Partnership
Basketweavers Project
Bike To Nature
Biodiversity Northwest
Blue Ribbon Coalition
Breitenbush Community
Breitenbush Hot Springs
Brownsville Pioneer Saddle Club
Butte Falls Advocates
California Cattlemens Association
California Coalition for Alternatives to Pesticides
Californians for Alternatives to Toxins
California Lichen Society
California Native Plant Society
California Trout
California Wilderness Coalition
Canadian Museum of Nature
Cascadia Forest Alliance
Cascadia Wildlands Project
CATs
Central Cascades Alliance
Central Oregon Motorcycle and ATV Club
Central Valley WQCB
Cheetwoot Wilderness Alliance
Chehalis Business Council
Citizens for Better Forestry
Citizens Interested in Bull Run
Clackamas-Marion Forest Protection Assn.
Claggett Creek Watershed Council
Coast Range Association
Columbia Basin Wildlife Association
Communities for a Great Oregon
Concerned Friends of Ferry County
Concerned Friends of the Winema
Corvallis Forest Issues Group
Cottage Grove Historical Society

Deer Creek Valley Natural Resource Conserve
Defenders of Wildlife
Drift-A-Way Snowmobile Club
Ducks Unlimited-South Oregon
Earth Justice Legal Defense Fund
Ecoforestry Institute
Ecology Center of Southern California
EF! Wolf Action Network
Endangered Species Coalition
Environmental Protection Information Center
Environmental Resources Center
Essex Junction Environmental Group
Forest Conservation Council
Forest Guardians
Forest Issues Group
Forest Landowners of California
Four Runners Four Wheel Drive Club
Franciscan Sisters of the Poor
Friends of Clackamas River
Friends of Del Norte County
Friends of the Greensprings
Friends of The River
Friends of Trees
Gifford Pinchot Task Force
Global Peoples Assembly Network
Grants Pass & Josephine County Chamber
of Commerce
Grants Pass Nordic Club
Great Lake United
Headwaters
High Country Citizens Alliance
High Desert Trail Riders
Hood Canal Coordinating Council
Humanity
Inland Empire Public Lands Council
Institute for Applied Ecology
Institute for Policy Research
Izaak Walton League of America
Keep Oregon Green
Keslick and Son Modern Arboriculture
Kettle Range Conservation Group
Klamath Basin Snowdrifters
Klamath Forest Alliance
Klamath Historical Society
Klamath Siskiyou Wildlands Center
Klamath Yacht Club
La Canada Flintridge Trails Council
Land and Water Fund of the Rockies
Lassen Forest Preservation Group
League of Wilderness Defenders
League of Women Voters of Lane County
Lincoln County Mycological Society
Little River Committee
M.U.D.D.
Marion County Water Watch
Mattole Salmon Group
Mazama Conservation Committee
McKenzie Guardians
McKenzie River Trust
McKenzie Watershed Council
Mendocino Environmental Center
Mendocino Forest Watch
Moose School Productions
Mt. Mazama Mushroom Association
Mt. Adams Adopt-A-District
National Association of Conservation
National Resources Conservation Service
National Wildlife Federation
Native Fish Society
Native Plant Society of Oregon
Audubon
Siskiyou Chapter
Nature Conservancy of Washington
NCASI West Coast Regional Center
North Applegate Watershed Association
North Coast Recreation Coalition
Northcoast Environmental Center
Northwest Ecosystem Alliance
Northwest Environmental Defense Center
Northwest Old-Growth Campaign
Northwest Rafters Association
Northwest Coalition for Alternatives to Pesticides
Nuview - Evaluation & Learning
Oak Ridge National Laboratory
OFREG
Olympic Forest Coalition
Olympic Natural Resources Center
Olympic Rivers Council
Oregon Bicycling Advisory Committee
Oregon Cattlemans Association
Oregon Coast Mycological Society
Oregon Council Rock and Mineral Clubs
Oregon High Desert Museum
Oregon Historical Society
Oregon Hunters Association
Oregon Independent Miners/BMOA
Oregon Institute of Technology
Oregon Lands Coalition
Oregon Mycological Society
Oregon Natural Desert Association
Oregon Natural Resources Council
Oregon Park Associates
Oregon Shares Conservation Coalition
Oregon Sheep Growers Association
Oregon Small Woodlands Association
Oregon Trail Coordinating Council
Oregon Trout
Oregon Waterfowl and Wetlands
Oregon Wetlands Joint Venture
Oregon Wildlife Federation
Oregonians for Action
Oregonians for Food and Shelter
Ouachita Watch League
Pacific Biodiversity Institute

Pacific Coast Federation of Fisherman's Assn.
Pacific Crest Trail Association
Pacific Northwest 4 Wheel Drive Assn.
Pacific Rivers Council
Pacific Wildlife Research
PEER
People for the USA Happy Camp
Predator Conservation Alliance
Public Lands Foundation
Reed College Forest Watch
Rocky Mountain Ecosystem Defense
Rogue Fly Fishers
Roseburg Resources
Rural Information Network
Santiam Wilderness Committee
Save Our Klamath Jobs
Seattle Lichen Guild
Shenandoah Ecosystems Defense Group
Sierra Club
- Cascade Chapter
- Illinois Valley
- Many Rivers Group
- Northern Great Plains
- Northwest
- New York City Chapter
- Plant Society
- Redwood Chapter
- Rogue Group
- Tillamook
- Yahi Group

Sierra Club Legal Defense Fund
Siskiyou Project
Siskiyou Regional Education Project
Smith River Advisory Council
Smith River Alliance
SOCATS
Society for Range Management
Society of American Foresters
South Carolina Forest Watch
Southern Apalachian Biodiversity Project
Southern Oregon Alliance for Resources
Southern Oregon Forest Coalition
Southern Oregon Timber Industry Association
Southern Willamette Earth First!
Steamboaters
Stillwater Sciences
Stop Oregon Litter and Vandalism
Sublette Riders Association
Sutherlin Watershed Action Committee
Takilma Watershed Committee
TELAV
The Cascadians
The Ecology Center
The Nature Conservancy
The Ptarmigans
The Wilderness Society, NW Regional Office
Trees of Mystery
Trout Unlimited
Umpqua Watersheds, Inc.
United Anglers of California
University of Oregon, Survival Center
Vancouver Wildlife
Washington Wilderness Coalition
Washington State Hi-Lakers
Washington State Snowmobile Association
Washington Trout
Washington Wilderness Coalition
Water For Life
WELC
West Montana Mycological
Western Environmental Law Center
Western Fire Ecology Center
Western Forest Industries Association
Western Forestry & Conservation Association
Western Mining Council
Wetlands Conservancy
Wilderness Watch, NW Chapter
Wildlife Society, Oregon Chapter
Willamette Provincial Advisory Committee
Willits Environmental Center
World Wildlife Fund
Xerces Society

Libraries, Schools, and Universities

Central Washington University
Colorado State University Libraries
Evergreen State College, Env Resource Center
Humboldt State University
- Department of Biological Sciences
- Forestry Department

Klamath County Library
Klamath Union High School
Land-Air-Water Law Center
Lane Community College Library
Mazama High School
Oregon State University
- Botany Department
- Extension Office
- Lichen & Bryophyte Study Group

Peninsula College
Salem State College, Dept of Geography
Southern Oregon University, Library
State of Illinois University
University of Alabama
University of California Physics Department
University of Hawaii
University of Massachusetts
University of Oregon
- Documents Department
- Library

University of Washington
Utah State University
World Botanical Association

Media

Ashland Daily Tidings
Environmental Media Services
The Associated Press
The Chronicle
The Columbian
The Empty Bell
The Glide Weekly
KMTX TV
News Review

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Jeff Stewart
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Jessica Stults
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Liann Sundquist
Jennifer Surdy
D. Sutter
Chris Sutton
Timothy Sutton
Hisami Suzuki
William A. Swann
Arland Swanson
J. Swanson
Joanne Swanson
John R. Swanson
Peter Swanson
Linda Swanson-Davies
William Sweet
Tracy Swenson
Catherine Syverson
Deborah J. Tabert
Adam Tabrys
Patti Taksa
T. Derby Talbot
Laura Talga
Trevor Talley
Mona Tanaka
Chin-Wei Tank
Deloris Tarzan
Larissa Gauslard Tatso
Edward S. Taub
Susannah Wood Tavernier
A. Marc Taye
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Kathleen Tyau
Pam Uihlein
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Jessie Unger
Krag Unsoeld
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Lori Valentine
Cheryl L. Vallone
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William G. Van Vliet
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D. Vanderslice
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Piper Weinkey
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Lornie White
Randall White
Sue Ellen White
Sandra Whiting
Andrew Whitmarsh
Sheila Whitmore
Mary Whittenberger
Gail Wiener
David Wiggins
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Pamela Wilcox
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Alex Williams
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Donald C. Williams
Hank Williams
John David Williams
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Patricia & John Winquist
April Winters
Andrea L. Wipf
Wynne Wirth
Gerald & Robin Wisdom
Ryan Wise
Ron Wishnoff
Jack Wisman
Rhoda Wisman
Tim Withee
Mary Joan Wittermood
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Anya Woestwin
Cliff Woglom
Elise Wolf
Kristi P. Wolf

Rachel Wolf
Gerry Wolfe
Marcy E. Wolff
Peggy Wolff
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Ilsa Snow Wood
Lea Wood
Sybil Wood
Laura Woodry
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Charles & Marion Wright
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Ronald Yockim
Bill Yocum
Neil L. York
Fachelle & Jerry Yoskowitz
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Appendices

Appendix 1

STANDARDS AND GUIDELINES

for
Survey and Manage

January 2001

Excerpted From

ATTACHMENT 1

to the Record of Decision
for Amendments to the Survey and Manage, Protection Buffer, and Related Mitigation Measures Standards and Guidelines

Lead Agencies: **Forest Service - U.S. Department of Agriculture**
Bureau of Land Management - U.S. Department of the Interior

Note: The Table 1-1 referenced in these standards and guidelines is not included because it was updated in June 14, 2002 as a result of the Annual Species Review Process. The results of that update are shown in this (2003) SEIS on Table 2-8 at the end of Chapter 2.

Sections IX, X, and XI of these Standards and Guidelines are not included here because they were not part of the Survey and Manage Standards and Guidelines. Those sections deal with certain cavity nesting birds, Canada lynx, and some bat roosts. Those sections are not proposed for removal or modification by any of the alternatives in this (2003) SEIS.

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TABLES AND EXHIBITS

Omitted. However, the current species placements by Survey and Manage category are shown on Table 2-8 at the end of Chapter 2.

Standards and Guidelines for Survey and Manage

All sections of this document are the complete compilation of standards and guidelines.

I. Introduction

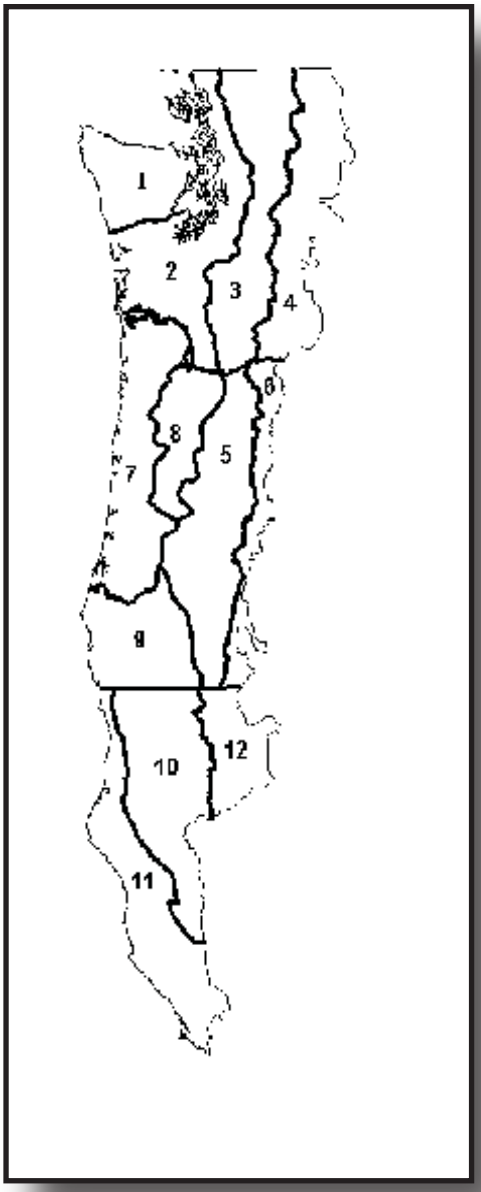
Existing Standards and Guidelines Are Amended

The standards and guidelines in the April 13, 1994, Northwest Forest Plan Record of Decision for Survey and Manage, Protection Buffers, Protect Sites From Grazing, Manage Recreation Areas to Minimize Disturbance to Species, and Provide Additional Protection for Caves, Mines, and Abandoned Wooden Bridges and Buildings That Are Used as Roost Sites for Bats (hereafter referred to as Survey and Manage and related mitigation measures) are removed in their entirety and replaced as described below. See Appendix B of the November 2000 *FSEIS for Amendment to the Survey and Manage, Protection Buffers, and other Mitigation Measures* for a complete display of the standards and guidelines to be removed. Except for certain cavity-nesting birds and Canada lynx described below, all former Protect Sites from Grazing species and Protection Buffer species are now either Survey and Manage species as described in the standards and guidelines below, or are removed from these standards and guidelines because they do not meet the Survey and Manage basic criteria. Known sites are managed as specified for the category to which they are placed, but the land allocations associated with Protection Buffer species sites (unmapped Late-Successional Reserves and Managed Late-Successional Areas) are returned to their underlying or appropriate surrounding allocation.

Other elements of the Northwest Forest Plan not specifically addressed, and implementation memos and other policy interpretations not affected by changes in these standards and guidelines, are not changed. Exceptions to certain standards and guidelines for research or the Adaptive Management Process described in Chapter E of the Northwest Forest Plan Standards and Guidelines, for example, continue to apply to Survey and Manage as under the Northwest Forest Plan Record of Decision.

Physiographic Provinces

The 1994 Northwest Forest Plan Standards and Guidelines include two different province maps: physiographic provinces and planning provinces. The map of the 12 physiographic provinces appears on page A-3 of the Northwest Forest Plan Standards and Guidelines and is repeated here for reference (see Figure 1 - Physiographic Provinces). The physiographic provinces allow differentiation between areas of common biological and physical processes. Unless otherwise identified, references to “provinces” in these standards and guidelines are to physiographic provinces. The 12 physiographic provinces are:



1. WA Olympic Peninsula
2. WA Western Lowlands
3. WA Western Cascades
4. WA Eastern Cascades
5. OR Western Cascades
6. OR Eastern Cascades
7. OR Coast Range
8. OR Willamette Valley
9. OR Klamath
10. CA Klamath
11. CA Coast Range
12. CA Cascades

Species Removed from Survey and Manage and other Standards and Guidelines

Species formerly included on Survey and Manage or related mitigation measures that are removed only because they are not closely associated with late-successional or old-growth forests (see Table 1-2) are already on, or are being considered for, the Agencies' special status species programs. Known sites for these species will be managed until their disposition is clarified under the special status species programs or a decision is documented not to include them. For all other species removed from Survey and Manage or related mitigation measure, current "known sites" of these species are released for other resource activities.

Arthropod Guilds

For arthropods, references in these standards and guidelines to species or taxa apply only to these four functional groups, and no individual species will be added to Survey and Manage.

Land Allocations

These standards and guidelines apply to all land allocations.

II. Survey and Manage Basic Criteria

The Survey and Manage three basic criteria (see box) must be met for a species to be included in the Survey and Manage Standards and Guidelines. Species no longer meeting these criteria will be removed from Survey and Manage. The process for adding or removing a species is described in the Adaptive Management section. The following section describes "persistence" and the criteria used to determine when there is concern for persistence.

Species Persistence Objectives

For purposes of these standards and guidelines, species persistence objectives have been adapted from the Northwest Forest Plan ROD (page 44). In general, these objectives may be described as providing for roughly the same likelihood of persistence as that which was provided by the Northwest Forest Plan as originally adopted in the 1994 ROD.

Three Basic Criteria for Survey and Manage

1. *The species must occur within the Northwest Forest Plan area, or occur close to the NFP area and have potentially suitable habitat within the NFP area.*

2. *The species must be closely associated with late-successional or old-growth forest (see Exhibit A).*

3. *The reserve system and other Standards and Guidelines of the Northwest Forest Plan do not appear to provide for a reasonable assurance of species persistence.*

More particularly, for vertebrate species, the Northwest Forest Plan specified use of the Forest Service viability provision in the National Forest System Land and Resource Management Planning Regulation for the National Forest Management Act of 1976, which reads in part as follows:

> *"Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area."* (36 CFR 219.19.)

The 1994 ROD identified compliance with this Forest Service regulation as a goal across both Forest Service and BLM administered lands as a means of serving the important policy goal of protecting the long-term health and sustainability of all of the federal forests within the range of the northern spotted owl and the species that inhabit them (page 44). The Northwest Forest Plan ROD takes note of the fact that there is no specific or precise standard or technique for satisfying the viability provision (page 44), nor is there any requirement to conduct a viability analysis for each species. Instead, common sense and agency expertise must be used in making determinations of compliance with the viability provision (Seattle Audubon Society v. Moseley (W.D. Wash. 1992)). For non-vertebrate species, the Northwest Forest Plan satisfied "a similar standard (to the one reflected in the NFMA viability provision for vertebrate species) ... to the extent practicable" (p. 44). These overall objectives are summarized simply as the "persistence objectives" for these standards and guidelines.

As part of the background to the Northwest Forest Plan, the FEMAT report provided assessment of the effects of various management options on species associated with late-successional and old-growth forests. This assessment was based on expert panel evaluation of the likelihood that each option presented in the FEMAT report would provide sufficient habitat on federally managed lands for various distribution patterns of species populations for 100 years. This assessment was documented in the Northwest Forest Plan Draft SEIS. Between the Draft SEIS and the Final SEIS for the Northwest Forest Plan, additional analysis was done for those species whose original outcomes were potentially inconsistent with the stated species persistence objectives. This additional analysis identified Survey and Manage as one mitigation measure that could improve the likelihood of meeting species persistence objectives, particularly for rare species and those about which little is known. Survey and Manage, along with other mitigation measures, was adopted in the ROD. These mitigation measures, along with the assessment of outcomes by panels of experts, were among the factors the signers of the ROD used to determine that species objectives, including those directed by the National Forest Management Act regulations, were met (see Northwest Forest Plan ROD, pages 43 to 47). This determination was upheld by the courts.

For the November 2000 Survey and Manage FSEIS, expert effects writers again used outcome statements as part of their assessment process. These outcome statements were modified from those used by FEMAT to better fit typical Survey and Manage species (rare or endemic species or species about which little is known).

Objectives for maintaining species persistence for these standards and guidelines are the same as those described in the Northwest Forest Plan ROD. The objectives recognize that there is uncertainty associated with the continued persistence of species. Even absent any human-induced effects, the likelihood that habitat will continue to support species' persistence can vary among species. For example, the continued persistence of rare species, whose entire range may comprise only a few acres, is inherently at greater risk due to natural disturbance than species with larger ranges and more locations, when considered over the long term. Thus, the achievement of species persistence is not subject to precise numerical interpretation and cannot be fixed at any one single threshold (see Northwest Forest Plan ROD, page 44).

In general, these standards and guidelines are designed to help the Northwest Forest Plan provide for the persistence of late-successional and old-growth forest related species.

Concern for Persistence

One of the basic criteria for applying the Survey and Manage mitigation to a species is concern for persistence. A **concern for persistence** exists when the reserve system and other standards and guidelines of the Northwest Forest Plan do not appear to provide a reasonable assurance of species persistence. **Little or no concern for persistence** exists when the reserve system and other standards and guidelines of the Northwest Forest Plan (other than Survey and Manage) provide a reasonable assurance of persistence. When this assurance of species persistence exists, the species may be removed from Survey and Manage.

Criteria Indicating a Concern for Persistence: One or more of the following criteria, which are to be considered in the context of the reserve system and other standards and guidelines of the Northwest Forest Plan, may indicate a concern for species persistence. These criteria must be considered aside from the Survey and Manage provisions, and must apply within the Northwest Forest Plan area.

- Low-to-moderate number of likely extant known sites/records in all or part of a species range.
- Low-to-moderate number of individuals.
- Low-to-moderate number of individuals at most sites or in most populations.
- Very-limited to somewhat-limited range.
- Very-limited to somewhat-limited habitat.
- Distribution within habitat is spotty or unpredictable in at least part of its range.

Criteria Indicating Little or No Concern for Persistence: Usually, most of the following criteria need to be met to indicate that a concern for persistence does not exist. These criteria must apply within the Northwest Forest Plan area.

- Moderate-to-high number of likely extant sites/records.
- High proportion of sites and habitat in reserve land allocations; or limited number of sites within reserves, but the proportion or amount of potential habitat within reserves is high and there is a high probability that the habitat is occupied.
- Sites are relatively well distributed within the species range.
- Matrix Standards and Guidelines or other elements of the Northwest Forest Plan provide a reasonable assurance of species persistence.

Concern for persistence is based on existing knowledge and, therefore, may change over time. While concern will remain for some species that are truly rare, the concern for many species will be alleviated as more information is accumulated through pre-disturbance and strategic surveys, and considered with the criteria indicated above. A species for which there is no longer a concern for persistence will be removed from Survey and Manage as described in the adaptive management section.

Relative Rarity

The standards and guidelines subdivide species for which there is a concern for persistence by their relative rarity, as either "rare" or "uncommon." The relative rarity subdivision is based on such factors as numbers of populations, distribution, commonality of habitat, population trends, numbers of individuals, and so forth. Placement of species in management categories depends largely on their relative rarity as described below. Management directions for "rare" and "uncommon" species are not the same, because relative rarity changes the level of concern and, therefore, the management needed to provide for a reasonable assurance of persistence. Like concern for persistence, this subdivision is based on current knowledge and is changeable.

A determination that a species is "rare" is based on a combination of information, as described in the criteria for each category. A species may be rare if it has: (1) limited distribution; (2) a low number of sites or individuals per site; (3) highly specialized habitat requirements; (4) declining habitat or population trends; (5) reproductive characteristics that limit population growth rates; (6) restricted distribution pattern relative to range or potential habitat; and/or, (7) narrow ecological amplitude.

A determination that a species is "uncommon" is based on information that indicates a species may have: (1) more widespread distribution; (2) higher number of sites; (3) low-to-high number of individuals per site; (4) more stable populations or habitats; (5) less restricted distribution pattern relative to range or potential habitat; and, (6) moderate-to-broad ecological amplitude (see criteria under each category, later in this chapter).

III. Survey and Manage Categories

Introduction

These standards and guidelines are designed to provide approximately the same level of species protection as intended in the Northwest Forest Plan. Survey and Manage species are grouped into six categories (A-F) as shown below. The six categories are based on level of relative rarity, ability to reasonably and consistently locate occupied sites during surveys prior to habitat-disturbing activities, and the level of information known about the species or group of species.

The six categories help delineate species objectives and apply specific management direction, compared to the previous four Northwest Forest Plan categories, partly because each species is assigned to only one category for all or part of its range. The standards and guidelines describe the objective, assignment criteria, and management direction for each category.

The species included in Survey and Manage, and the category to which each species, or portion of the range of each species, is assigned, is shown on Table 1-1, Species Included in Survey and Manage Standards and Guidelines and Category Assignment. The adaptive management section of these standards and guidelines define how to change species among the six categories and how to add or remove species from Survey and Manage, in response to new information.

These standards and guidelines apply within all land allocations; however, the Survey and Manage provision for each species will be directed to the range (or portion of range) of that species, to the particular habitats where concerns exist for its persistence, and to the management activities considered "habitat-disturbing" for that species. The Survey and Manage Standards and Guidelines will benefit species closely associated with late-successional and old-growth forests including certain amphibians, birds, mammals, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropod groups. Information about these species, acquired through application of these standards and guidelines, should facilitate project planning and adaptive-management changes.

Redefine Categories Based on Species Characteristics			
Relative Rarity	Pre-Disturbance Surveys Practical	Pre-Disturbance Surveys Not Practical	Status Undetermined
Rare	Category A - 57 species Manage All Known Sites Pre-Disturbance Surveys Strategic Surveys	Category B - 222 species Manage All Known Sites N/A Strategic Surveys	Category E - 22 species Manage All Known Sites N/A Strategic Surveys
Uncommon	Category C - 10 species Manage High-Priority Sites Pre-Disturbance Surveys Strategic Surveys	Category D - 14 species[1] Manage High-Priority Sites N/A Strategic Surveys	Category F - 21 species N/A N/A Strategic Surveys
[1] Includes three species for which pre-disturbance surveys are not necessary.			

The following text describes the six categories. The category discussions include additional information that clarifies the linkage between objectives and management actions of each category and describes the criteria for assigning species to the various categories. A taxon, or range-defined portion of a taxon, can be assigned to only one category.

Category A (Rare, Pre-Disturbance Surveys Practical)

Objective: Manage all known sites and minimize inadvertent loss of undiscovered sites.

Criteria for assigning a species to Category A are:

- The species is rare and all known sites or population areas are likely to be necessary to provide reasonable assurance of species persistence, as indicated by one or more of the following:
  - Low number of likely extant sites/records on federal lands indicates rarity.
  - Species poorly distributed within its range or habitat.
  - Limited number of individuals per site.
  - Highly specialized habitat requirements (narrow ecological amplitude).
  - Dispersal capability limited relative to federal habitat.
  - Microsite habitat limited.
  - Reproduction or survival not sufficient.
  - Low number of sites in reserves or low likelihood of sites or habitat in reserves.
  - Habitat fragmentation that causes genetic isolation.
  - Factors beyond management under the Northwest Forest Plan affect persistence, but special management under the Northwest Forest Plan will help persistence.
  - Declining habitat trend

and:

- Pre-disturbance surveys are practical.

Management Direction:

Manage All Known Sites: Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations. (See glossary for definition of "known site.")

Professional judgment, coupled with locally specific information and advice from taxa specialists about the species, may be used to identify occasional sites not needed for persistence. These exceptions will be reviewed by the REO.

Surveys Prior to Habitat-Disturbing Activities: Surveys will be conducted at the project level

prior to habitat-disturbing activities, and in accordance with Survey Protocols, to avoid loss of undiscovered sites by habitat-disturbing activities. Species sites found as a result of these surveys will be managed as known sites.

Strategic Surveys: The objective of strategic surveys in this category is to search for additional sites and to characterize the habitat, improving the ability of the Agencies to know where to survey and how to manage the species. These surveys will build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of these strategic surveys will be managed as known sites.

Strategic Surveys may address one or more of the following:

- Are known sites still extant?
- What is the habitat of the species?
- Identify high-probability habitat for surveys to find new sites.
- Where else does the species occur? Find new sites.
- Collect habitat information to assist with managing the species.
- What is the status of the population (such as number of individuals, size)?
- What is the distribution of the species relative to the land allocations established in the Northwest Forest Plan?

Category B (Rare, Pre-Disturbance Surveys Not Practical)

Objective: Manage all known sites and reduce the inadvertent loss of undiscovered sites.

Criteria for assigning a species to Category B:

- Same criteria as Category A, except that pre-disturbance surveys are not practical.

Management Direction:

Manage All Known Sites: Same as Category A.

Strategic Surveys: The objective of strategic surveys in this category is to find additional new sites and to characterize the habitat, improving the ability of the Agencies to know where to survey and how to manage and conserve the species. To reduce the inadvertent loss of undiscovered sites, the Agencies will not sign NEPA decisions or decision documents for habitat-disturbing activities in old-growth forest (a sub-set of late-successional forest - see glossary) in fiscal year 2006 (fiscal year 2011 for fungi) and beyond, unless either:

- strategic surveys have been completed for the province that encompasses the project area, or
- equivalent-effort surveys have been conducted in the old-growth habitat to be disturbed.

Strategic surveys build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of strategic surveys will be managed as known sites. Strategic survey accomplishments, including completion by province, will be summarized in the annual report. “Old growth” is specified in this standard and guideline to assure retention of what is assumed to be the highest quality potential habitat for Survey and Manage species until strategic surveys are completed or equivalent-effort surveys are conducted. “Province” is specified as the geographic unit in which to assess completion of strategic surveys given that it represents the smallest, logical, well-defined area for which the results of strategic surveys likely could be compiled, analyzed, and presented with meaningful results.

Strategic Surveys may address one or more of the following:

- Are known sites still extant?
- What is the habitat of the species?
- Identify high-probability habitat for surveys to find new sites.
- Where else does the species occur? Survey high-probability habitat at highest risk to find new sites.
- What is the distribution of the species relative to the land allocations established in the Northwest Forest Plan?
- Collect habitat information to assist with managing the species.
- What is the status of the population (such as number of individuals, size)?

Category C (Uncommon, Pre-Disturbance Surveys Practical)

Objective: Identify and manage high-priority sites to provide for reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites.

Criteria for assigning a species to Category C are:

- The species is uncommon, and not all known sites or population areas are likely to be necessary for reasonable assurance of persistence, as indicated by one or more of the following:
  - A higher number of likely extant sites/records does not indicate rarity of the species.
  - Low-to-high number of individuals per site.
  - Less restricted distribution pattern relative to range or potential habitat.
  - Moderate-to-broad ecological amplitude.
  - Moderate-to-high likelihood of sites in reserves.

and,

- Pre-disturbance surveys are practical.

Management Direction:

Manage High-Priority Sites: High-priority sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations. Until a Management Recommendation is written addressing high-priority sites, either assume all sites are high priority, or local determination (and project NEPA documentation) of non-high priority sites may be made on a case-by-case basis with: (1) guidance from the Interagency Survey and Manage Program Manager; (2) local interagency concurrence (BLM, FS, USFWS); (3) documented consideration of the condition of the species on other administrative units as identified by the Program Manager - typically adjacent units as well as others in the species range within the province; and, (4) identification in ISMS. The Survey and Manage Program Manager will involve appropriate taxa specialists.

Professional judgment, coupled with locally specific information and advice from taxa specialists about the species, may be used to identify occasional high-priority sites not needed for persistence. These exceptions will be reviewed by the REO.

Surveys Prior to Habitat-Disturbing Activities: Surveys will be conducted at the project level prior to habitat-disturbing activities and in accordance with Survey Protocols. Sites found as a result of these surveys will be managed as described above under manage high-priority sites. Management Recommendations or Survey Protocols may specify habitats or conditions (e.g., seral stages) not needing surveys because “high-priority” sites are not expected to be found there.

Strategic Surveys: The objective of strategic surveys in this category is to gather information to either develop or revise Management Recommendations, which will include identifying high-priority sites for management and how to manage to provide for a reasonable assurance of species

persistence. Strategic surveys build upon and incorporate information from previous and ongoing surveys. Sites found as a result of these surveys will be managed as described above under manage high-priority sites.

Strategic Surveys may address one or more of the following:

- What is the quality of the known sites (such as habitat characteristics, longevity and continuity of habitat, and the status and characteristics of the population)?
- What is the geographic distribution of sites and extent of the range of species within the area of the Northwest Forest Plan (such as distribution of sites in the Northwest Forest Plan reserve allocations and the connectivity of known sites, both spatially and temporally)?
- Where does the species occur? Find new high-priority sites.
- Obtain information on habitat requirements to help manage known sites (e.g., developing Management Recommendations and identifying high-priority sites).

Category D (Uncommon, Pre-Disturbance Surveys Not Practical or Not Necessary)

Objective: Identify and manage high-priority sites to provide for a reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites.

Criteria for assigning a species to Category D:

- Same criteria as Category C, except that pre-disturbance surveys are not practical or are not necessary to meet objectives for species persistence because inadvertent loss of some undiscovered sites would not change level of rarity.

Some species for which pre-disturbance surveys are practical are placed in this category if there are a sufficient number of sites known to meet species objectives, and either Management Recommendations need to be written to define high-priority sites for management, or strategic surveys are needed to confirm distribution in reserves prior to future removal from Survey and Manage. These species are specifically identified on Table 1-1.

Management Direction:

Manage High-Priority Sites: Same as Category C.

Strategic Surveys: The objective of strategic surveys in this category is to gather information to either develop or revise Management Recommendations, which will include identifying high-priority sites for management and how to manage to provide for a reasonable assurance of species persistence. Strategic surveys build upon and incorporate information from previous and ongoing surveys. Sites found as a result of these surveys will be managed as described above under manage high-priority sites.

Strategic Surveys may address one or more of the following:

- What is the quality of known sites (such as habitat characteristics, longevity and continuity of habitat, and status and characteristics of population)?
- What is the geographic distribution of sites and extent of the species range within the area of the Northwest Forest Plan (such as distribution of sites in the Northwest Forest Plan reserve allocations and the connectivity of known sites, both spatially and temporally)?
- Where does the species occur? Find new high-priority sites.
- Obtain information on habitat requirements to help manage known sites (such as developing Management Recommendations and identifying high-priority sites).

Category E (Rare, Status Undetermined)

Objective: Manage all known sites while determining if the species meets the basic criteria for Survey and Manage and, if so, to which category (A, B, C, or D) it should be assigned.

Criteria for assigning a species to Category E:

- The number of likely extant sites/records and survey information on federal lands indicates possible rarity of the species; and
- Information is insufficient to determine whether Survey and Manage basic criteria are met or to determine what management is needed for a reasonable assurance of species persistence.

Management Direction:

Manage All Known Sites: Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a), and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.

Professional judgment, coupled with locally specific information and advice from taxa specialists about the species, may be used to identify occasional sites not needed for persistence. These exceptions will be reviewed by the REO.

Strategic Surveys: The objective of strategic surveys in this category is to collect enough information to determine if the species meets the basic criteria for Survey and Manage, and to either place the species into the appropriate Survey and Manage category or remove the species from Survey and Manage.

Strategic surveys build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of these surveys will be managed as known sites. In cases where the strategic survey indicates that there is still a concern for persistence, but the species is not closely associated with late-successional or old-growth forests, the species will be removed from Survey and Manage and considered for the Agencies' special status species programs.

Strategic Surveys may address one or more of the following:

- Is the species closely associated with late-successional and old-growth forests?
  - Revisit known sites, characterize the species habitat, and find new sites.
- Does the species occur within the Northwest Forest Plan area?
  - Survey potential habitat near known sites.
- What is the appropriate management for the species?
  - Does the species meet the basic criteria for Survey and Manage?
  - What is the appropriate Survey and Manage category?

Category F (Uncommon or Concern for Persistence Unknown, Status Undetermined)

Objective: Determine if the species meets the basic criteria for Survey and Manage and, if so, to which category (A, B, C, or D) it should be assigned.

Criteria for assigning a species to Category F:

- The species is uncommon and the number of likely extant sites/records and survey information does not indicate rarity; and
- Information is insufficient to determine whether Survey and Manage basic criteria (including

whether there is a concern for persistence) are met, or to determine what management is needed for reasonable assurance of species persistence.

Management Direction:

Manage known sites is NOT required for this category because species are uncommon, not rare, and species within this category will be assigned to other categories or removed from Survey and Manage as soon as new information indicates the correct placement. Until that time, inadvertent loss of some sites is not likely to change the level of rarity. Other management direction is yet to be determined.

Strategic Surveys: The objective of strategic surveys in this category is to collect enough information to determine if the species meets the basic criteria for Survey and Manage, and to either place the species into the appropriate Survey and Manage category or remove the species from Survey and Manage. These surveys will build upon and incorporate information from previous and ongoing surveys. In cases where the strategic survey indicates there is still a concern for persistence, but the species is not closely associated with late-successional or old-growth forests, the species will be removed from Survey and Manage and considered for the Agencies' special status species programs.

Strategic Surveys may address one or more of the following:

- Is the species closely associated with late-successional or old-growth forests?
- Does the species occur within the Northwest Forest Plan area?
- What is the appropriate management for the species?
  Does the species meet the basic criteria for Survey and Manage?
  What is the appropriate Survey and Manage category?
- What is the level of rarity?

IV. Adaptive Management Process

Introduction

The following adaptive management detail is designed to make the standards and guidelines more efficient for the Agencies to implement and more responsive to the needs of the species. The specific criteria for refining or changing species management are based on the strategies and objectives of the specific categories.

This process covers the acquisition, evaluation, and application of new information to move species between categories, remove species from Survey and Manage, add species to Survey and Manage, and develop or revise Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide. The process described here will not change the number of categories, their definition or objectives, or the specific defining criteria or management direction applicable to the categories. Changes of that type would fall under the general adaptive management discussion in the Northwest Forest Plan Record of Decision, page E-12 through E-15.

The adaptive management process for Survey and Manage Standards and Guidelines includes three steps:

1. Acquiring new information relative to Survey and Manage species.
2. Evaluating new information.
3. Implementing changes or refinements to Survey and Manage.

These three steps are described individually below.

Acquiring New Information Relative to Survey and Manage Species

New knowledge may arise from various sources. New information concerning species status or needs, and efficiency of the standards and guidelines, will be generated mostly through strategic and pre-disturbance surveys and other implementation experience as done in the past. The Agencies will also use a data call, open conference, or other method of soliciting appropriate new information about Survey and Manage species to help locate new credible information needed for conduct of the Species Review Process. Sources of new information may also include taxa experts, resource specialists, scientists, data from Agency surveys, research, and members of academia and other publics. This information is maintained primarily in the Interagency Species Management System (ISMS) database. New information may lead to adding, removing, or changing species assignments to Survey and Manage categories, as described below, or lead to changes to Management Recommendations and Survey Protocols, and changes to information needs identified in the Strategic Survey Implementation Guide, as described below and elsewhere in these standards and guidelines.

Evaluating New Information for Adding, Removing, or Changing a Species In Survey and Manage

A regional-level interagency group including taxa experts (see Species Review Process in Exhibit B), meeting at least annually, will weigh new information against the criteria below to determine if additions or deletions of species from Survey and Manage or changes of species among categories, are warranted. Partial information or proposals to add or change species will not obligate the Agencies to gather additional information.

New information presented for evaluation in considering changes to Survey and Manage should address the criteria described below, as appropriate. The basic criteria for Survey and Manage are key to the evaluation process when proposing to add, remove, or change a category.

Three Basic Criteria for Survey and Manage

1. *The species must occur within the Northwest Forest Plan area, or occur close to the NFP area and have potentially suitable habitat within the NFP area.*

2. *The species must be closely associated with late-successional or old-growth forest (see Exhibit A).*

3. *The reserve system and other Standards and Guidelines of the Northwest Forest Plan do not appear to provide for a reasonable assurance of species persistence.*

Criteria for Adding Species to Survey and Manage

Species proposed for addition to the Survey and Manage Standards and Guidelines must be taxonomic entities published in appropriate peer-reviewed journals accepted by the scientific community and, based on currently available information, must meet all three of the basic criteria for Survey and Manage.

The new information to support addition of a species to Survey and Manage must address the three basic criteria including the specific factors used as a basis for determining concern for persistence. The factors must apply to at least an identified portion of the species range, on federal lands, within the Northwest Forest Plan area.

One or more of the following factors may indicate that persistence is a concern. These factors must be considered

in the context of other standards and guidelines (other than those related to Survey and Manage) in the Northwest Forest Plan:

- Low-to-moderate number of likely extant known sites/records in all or part of species range.
- Low-to-moderate number of individuals.
- Low-to-moderate number of individuals at most sites or in most populations.
- Very-limited to somewhat-limited range.
- Very-limited to somewhat-limited habitat.
- The distribution of the species within habitat is spotty or unpredictable in at least part of its range.

Criteria for Removing Species from Survey and Manage

When new information indicates that a species no longer meets the Survey and Manage basic criteria, the species will be proposed for removal from the Survey and Manage Standards and Guidelines.

New information to support removing a species from the Survey and Manage Standards and Guidelines may address any one of the three Survey and Manage basic criteria. If a species is proposed for removal from the Survey and Manage Standards and Guidelines because there is not a concern for its persistence, the new information must address specific factors indicating that persistence is not a concern as listed below. The factors must apply to at least an identified portion of the species range, on federal lands, within the Northwest Forest Plan area.

Usually, most of the following factors must be true to indicate that persistence is not a concern:

- Moderate-to-high number of likely extant sites/records.
- High proportion of sites and habitat are in reserve land allocations; or limited number of sites within reserves, but proportion or amount of potential habitat within reserves is high, and there is high probability that the habitat is occupied.
- Sites are relatively well distributed within the species range.
- Matrix Standards and Guidelines or other elements of the Northwest Forest Plan provide for reasonable assurance of species persistence.

Species removed from the Survey and Manage Standards and Guidelines because they are not closely associated with late-successional or old-growth forests, but are still of concern for persistence, will be considered for inclusion in the Agencies' special status species programs.

Criteria for Changing a Species from One Category to Another in Survey and Manage

New information to support changing a species from one Survey and Manage category to another must address the specific criteria for the categories involved in the change. The new information must support the proposed change by showing how the species better meets the criteria for the proposed category.

The criteria for assigning a species to a different category are included under the Description of Categories section earlier in these standards and guidelines.

Analysis Process for New Information

The process for analyzing or evaluating new information pertaining to species will involve a panel of agency taxonomic experts, resource specialists, and managers similar to the process used to evaluate new information in 1999 and 2000 (see Species Review Process in Exhibit B). The panel of experts will convene at least once a year to evaluate and respond to new accumulated information and to propose changes to appropriate management of species under the Survey and Manage Standards and Guidelines to the RIEC.

The panel will use the specific criteria and factors defined for making determinations regarding whether there is a concern for persistence and placement of species within individual categories of Survey and Manage. Because Survey and Manage includes species about which little is known, the number and combination of criteria and factors used in making a judgment about concern for persistence or appropriate placement of each species within individual categories will vary, depending on the species and the type and quality of information available. The application of the criteria in the analysis process necessarily relies on the professional judgments of the panel of experts.

For purposes of these evaluations, the factors and criteria listed in these standards and guidelines and applied to each species will constitute the foundation of the assumptions, criteria, factors, and logic to support the conclusions. Application of the information to the criteria will be documented in writing for the record. The recommendations from the panel will be disseminated to lead and cooperating agency taxa experts in draft form for at least 30 days to identify errors, conflicting information, or other evidence that should be included with the information presented by the panel to the RIEC. Details of the Species Review Process will be available as administrative record for actions applying resultant changes in the future.

The Species Review Process proposed for future adaptive management changes under these standards and guidelines was developed and used in 1999 and again in 2000 for species analysis in the November 2000 Survey and Manage FSEIS (see Exhibit B).

Implementing Changes or Refinements to Survey and Manage

Making Changes to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide

Changes proposed to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide as a result of new information pertaining to species, or new information resulting from application experience, will be made using the same process used to develop the original Recommendations and Protocols. Changes to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide constitute administrative changes to the technical details of specific site management and surveys, and it is not anticipated such changes will require any further NEPA documentation.

Adding, Removing, and Changing Species Between Categories

The criteria and evaluation process for species that is presented in Exhibit B, and otherwise described in these standards and guidelines for use in future adaptive management changes, is designed to continue approximately the same level of assurance of persistence as intended by these standards and guidelines. The process and results should be relatively consistent over time because the assumptions, criteria, and logic used in reaching determinations relating to species disposition under the Survey and Manage Standards and Guidelines will remain constant. Proposed changes to assignments of species to categories and proposals to remove species from Survey and Manage, resulting from the periodic evaluations of new information, will be forwarded to the RIEC for review to ensure that current information about the species has been appropriately considered and weighed against the stated criteria, and that the resultant proposal continues to provide at least the level of protection intended by the standards and guidelines. Adaptive management changes to assignments of species will be jointly adopted by the BLM and Forest Service and included in the annual report, along with a summary of the information supporting the changes. Since the effects to species are expected to be consistent with the effects anticipated and described in the November 2000 Survey and Manage FSEIS, it is not anticipated such changes will require regular, annual NEPA documentation. The parameters for making adaptive changes are part of the standards and guidelines, and as long as the changes are

within these parameters, they would not constitute a change in these standards and guidelines or constitute new information on effects not already anticipated and addressed in the above FSEIS. Prior to the annual application of results, the Agencies will examine whether the magnitude and nature of changes indicate a need for additional environmental analysis (e.g., an Environmental Assessment). The results of this examination will be documented and summarized in the Annual Status Report. It is not anticipated that changes made pursuant to the species review process will require regular, annual NEPA documentation for three major reasons. First, the parameters for making such changes are clearly delineated and part of these standards and guidelines. Second, adjustments made pursuant to the annual species review process are fully expected to occur and are included in the set of assumptions on which the effects analyses of the November 2000 Survey and Manage Final SEIS have been made. Third, the status of species relative to the standards and guidelines should remain consistent with, and at least as secure as, that reflected in the Final SEIS, given that the criteria guiding the species review process have been designed in large measure to achieve such consistency. The Agencies will evaluate such changes over time to ensure their application is having the intended result and their accumulated effects are within the scope anticipated by this SEIS. At some point in the future, if such effects rise to the level exceeding that scope, supplemental NEPA analyses can be expected to be conducted at appropriate intervals as necessary or advisable.

The Agencies will involve the public and keep resultant changes and their application visible to the public so potential concerns about application of the above criteria to any particular species or area may be surfaced. First, the Agencies will utilize a data call, open conference, or other method of soliciting appropriate new information about Survey and Manage species. Second, the annual report will be sent to individuals or groups who request it. Individuals and groups that would like to receive the annual report should write to the Interagency Survey and Manage Program Manager, c/o Regional Ecosystem Office, P.O. Box 3623, Portland, OR 97208-3623. Public comments about species changes or anything else in the annual report are invited at any time, and should also be addressed to the Program Manager. Third, future Agency NEPA documents for habitat-disturbing activities will identify if any of these expected future changes in categories will be applied to the planned activity, or will reference a specific years assignments, as documented in the Annual Status Report, that appropriately applies to that activity or project. Specific public concerns about the application of a particular species assignment may be directed toward the activity applying the new assignment.

V. Management Recommendations

Management Recommendations are documents that address how to manage known sites (or manage high-priority sites) and that provide guidance to Agency efforts in conserving Survey and Manage species. They are written for the species range or, in rare cases, may apply to provinces within the range. They are the responsibility of management working closely with taxa experts; they are developed by taxa experts and land managers (at any administrative level) for use at field offices of the BLM and Forest Service. Because these documents describe site management, and for uncommon species, identify sites not needed to provide a reasonable assurance of persistence, they are subject to review by the REO. This review is to ensure they identify and integrate the habitat or life-history factors key to managing the species to the level of protection intended in the standards and guidelines.

Management Recommendations describe the habitat parameters (environmental conditions) that will provide for a reasonable likelihood of persistence of the taxon at that site. These parameters serve as the basis for site-specific decisions about the size of buffers to be applied and what management activities are appropriate within the site. The size of the area to be managed depends on the habitat and requirements for the species. Management may range from maintaining one or more habitat components (such as down logs or canopy cover) to complete exclusion from disturbance for many acres, and may allow loss of some individuals, areas, or elements not affecting continued site occupancy. In high fire frequency areas such as east of the Cascades or in the Klamath Provinces, specific consideration should be given to the acceptability of the use of

prescribed fire in known sites to reduce the risk of future large-scale or high intensity fire, even if it entails some risk to individual site occupancy.

Management Recommendations for uncommon species should also identify high-priority sites that must be managed to provide for a reasonable assurance of persistence of the taxon (or the procedures for designating such sites locally), as well as sites that no longer need to be managed for the benefit of those species. Management Recommendations may also identify areas where it is no longer necessary to continue surveys prior to habitat-disturbing activities or strategic surveys for the taxon. The Management Recommendation may also provide information on natural history, current species status, species distribution, management goals and objectives, specific management actions or recommendations, monitoring needs, and needs for information and research to the extent such information supports management of known sites, identification of high-priority sites, and identification of survey priorities. Finally, where information about a species indicates the combination of manage known sites, pre-disturbance surveys, and strategic surveys (and other standards and guidelines of the Northwest Forest Plan) does not provide a reasonable assurance of persistence or does not provide the most efficient way of meeting the persistence objective, Management Recommendations may include additional or in-lieu direction, subject to appropriate NEPA analysis. Such direction may rely on habitat models and other valid scientific analyses that indicate a high probability of occupancy by the species.

Management Recommendations written prior to the Record of Decision for this SEIS may continue to be used until superseded by later versions. Existing Management Recommendations will be revised as new information indicates a need. Revised versions may be applied immediately but will normally be applied to NEPA decisions or decision documents signed 90 or more days after release of the Management Recommendation. In some cases they may include a specific effective date or other language indicating when they are to be applied, depending on when they are issued, what differences there are from the previous version, and the importance of those differences.

For species newly assigned to categories requiring management of known sites, either as a result of the Record of Decision amending Survey and Mange, or the annual species review process, manage known site direction applies to NEPA decisions or decision documents (for habitat-disturbing activities) signed after the effective date of the new assignment.

Note for Species for Which Grazing is Identified as a Concern: The 1994 Northwest Forest Plan ROD identified a concern for grazing impacts to some of the species now included in Survey and Manage. For these species, the 1994 Northwest Forest Plan language of "known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted" is to be included in Management Recommendations for these species. For the three species for which the Northwest Forest Plan indicated grazing was the ONLY concern (identified on Table 1-1), this phrase is the complete Management Recommendation and no other recommendations are imposed at this time.

Note for Former Protection Buffer Species Included in Survey and Manage but Without Approved Management Recommendations: Management of known sites will follow the Northwest Forest Plan Protection Buffer direction (see Section XI of these standards and guidelines), latest information (including that displayed in the November 2000 Survey and Manage FSEIS), and best professional judgment until a Management Recommendation is approved. This affects great gray owl, the fungus *Sarcasoma mexicana*, and Del Norte, Siskiyou Mountains, Larch Mountain, and Shasta salamanders.

VI. Surveys

Surveys Prior to Habitat-Disturbing Activities (Pre-Disturbance Surveys)

Some categories of species require that site-specific, pre-disturbance surveys be conducted prior to signing NEPA decisions or decision documents for habitat-disturbing activities. These are "clearance" surveys that focus on the project unit with the objective of reducing the inadvertent loss of undiscovered sites by searching specified potential habitats prior to making decisions about habitat-disturbing activities. They are done according to the Survey Protocol for each species and can use methods such as transects or plots that focus on priority habitats, habitat features, or involve the entire project area. These surveys are often referred to simply as pre-disturbance surveys. There are two types of pre-disturbance surveys. Pre-disturbance surveys are "practical" for species whose physiological characteristics make them likely to be located with reasonable effort. The second type, "equivalent-effort" surveys, are prescribed as mitigation for eight (8) mollusk species whose characteristics, such as extremely small size or irregular cycles when identifying characteristics are visible, make identification during pre-disturbance surveys less likely. The differences between these two types of pre-disturbance surveys, as well as the definition of habitat-disturbing activities, timing requirements for surveys, and the requirements for survey protocols are described in more detail below.

Habitat-Disturbing Activities

Habitat-disturbing activities are defined as those disturbances likely to have a significant negative impact on the species' habitat, its life cycle, microclimate, or life support requirements. The evaluation of the scale, scope, and intensity of the anticipated negative impact of the project on habitat or life requirements should include an assessment of the type, timing, and intensity of the disturbing activity. "Habitat-disturbing" is not necessarily the same as "ground-disturbing"; helicopter logging or logging over snow-pack, for example, may not disturb the ground but might clearly affect microclimate or life cycle habitat factors. Conversely, an activity having soil-disturbing effects might not have a large enough scope to trigger a need to survey. Such a case would be the installation of a sign post within a campground. Routine maintenance of improvements and existing structures is not considered a habitat-disturbing activity. Examples of routine maintenance include pulling ditches, clearing encroaching vegetation, managing existing seed orchards, and falling hazard trees.

The line officer should seek specialists' recommendations to help determine the need for a survey based on site-specific information. In making such determination, the line officer should consider the probability of the species being present on the project site, as well as the probability that the project would cause a significant negative effect on the species habitat or the persistence of the species at the site.

Pre-disturbance surveys are not required in the unusual circumstance such that a delay in implementation of the activity (to permit pre-disturbance surveys) would result in greatly increased and unacceptable environmental risk. Such circumstances are subject to review by the REO to ensure the urgency of the activity justifies the risk to species.

Pre-disturbance surveys are not required for wildland fires for resource benefits in designated Wilderness. Wildland fires for resource benefits are prescribed fires that result from natural ignition, are consistent with the applicable land and resource management plan, are addressed in a fire management plan, and are burning within prescription. Even though prescriptions are written well in advance of the burn, pre-disturbance surveys are not required because they would be impractical given the large area covered by prescriptions and the irregular nature of natural ignitions, and because potential impacts to Survey and Manage species are limited because the objective of such fires is limited to mimicking natural processes and succession (1964 Wilderness Act, Section 2(a)) (FSM 2323.32). Exceptions to the pre-disturbance survey requirement may be

proposed, subject to REO review, for other wildland fires for resource benefits in backcountry, Wilderness Study Areas, roaded natural, and similar areas where the objective of such fires is similar to those in Wilderness.

Exceptions to the pre-disturbance survey requirement may also be proposed for wildland fire for resource benefits in Late-Successional Reserves if the Late-Successional Reserve Assessment addresses the potential presence and likely effect on Survey and Manage species, and REO review of that aspect of the Assessment concludes such fire(s) will not prevent achievement of the persistence objectives of these standards and guidelines.

Pre-Disturbance Survey Protocols

Survey Protocols for surveys prior to habitat-disturbing activities include instructions for locating the species. The instructions include such information as: likely habitat where the species is of concern, geographical area and substrate where the species is typically located, and timing of surveys to best locate the species, as well as appropriate search and sampling techniques, and detailed guidance for identifying the species. Supplemental information may include field identification guides and techniques for simple laboratory examination.

Pre-Disturbance Survey Protocols should also identify habitat conditions or locations, or criteria for identifying such conditions locally, where surveys are not needed for a reasonable assurance of persistence, and thus surveys are not needed. Such habitat may include, but not be limited to, seral stages, stand age, stand complexity, or stand origin, where occupied sites, if present, are likely incidental, non-viable, or otherwise not important for meeting overall species persistence objectives. For "uncommon" species, Survey Protocols should specify habitats or conditions (e.g., seral stages) not needing surveys because "high-priority" sites are not expected to be found there.

Existing Survey Protocols will be revised as new information indicates a need. Revised versions of protocols will normally apply to the next projects on which surveys are to be initiated. In some cases they may include a specific effective date, or other language indicating when they are to be applied, depending on when they are issued, what differences there are from the previous version, and the importance of those differences. The Record of Decision for November 2000 Survey and Manage SEIS does not invalidate existing Survey Protocols or previous surveys, and the Agencies may continue to use existing Survey Protocols in conducting pre-disturbance surveys until they are revised. Where these standards and guidelines require pre-disturbance surveys for species that required pre-disturbance surveys under the 1994 Northwest Forest Plan Standards and Guidelines (including mollusks requiring equivalent-effort surveys as mitigation), the requirement for pre-disturbance surveys continues to apply to all new activities with no break or grace period.

New Pre-Disturbance Survey Protocols will be prepared for species newly assigned to a category requiring surveys prior to habitat-disturbing activities, whether the category assignment is through these standards and guidelines, or a future assignment through the adaptive management process. The protocols will be prepared by the end of the fiscal year following the fiscal year the species was assigned. The decision date for activities to which these protocols apply will depend on the number of years a survey is required. If a protocol requires 1 year of surveys, activities may proceed for 1 additional fiscal year before pre-disturbance surveys are required, to allow time to conduct the required surveys. If a protocol requires two (2) years of surveys, activities may proceed for two (2) additional fiscal years before pre-disturbance surveys are required. For example, if a species is added to this category on January 1, 2001, the protocol will be prepared no later than September 30, 2002, and (assuming a 1-year protocol) the protocol will apply to activities for which NEPA decisions or decision documents are signed after September 30, 2003. Preparation of a protocol earlier than the due date does not necessarily change the required effective date; the Agencies may need the additional lead time for training, surveys, and related project planning. Actual effective dates will be set in the Survey Protocol documents or the Agencies' transmittal memos, but they will not be later than the above-described date.

Strategic surveys or other information may, in the future, expand the known range of a species requiring pre-disturbance surveys into areas not previously identified in Survey Protocols or ISMS-related species range maps. Confirmation of such expansions will occur with RIEC approval of the results of the annual species review process. Since protocols in these cases are already prepared, the survey requirement applies to activities whose NEPA decision or decision document is signed in the calendar quarter following the first full survey season (as defined in the protocol) after the expanded range is confirmed.

Timing Requirements for Pre-Disturbance Surveys

The intent of "surveys prior to habitat-disturbing activities" is to gather relevant information during the NEPA process so that it is available for the decision-maker before actions are taken. Ideally, this information would be available to the Interdisciplinary Teams during preparation of an EA or Draft EIS so it could be used in project analysis, formulation of alternatives, and evaluation of effects. Required surveys should be completed and their results included in an EA or Draft EIS whenever practicable. This would have the added advantage that results would be available during the public review and comment process.

Project schedules could be severely disrupted if the requirement for additional pre-disturbance surveys were imposed after the decision is made and final design, field layout, or contract preparation has begun. Therefore, the date of the decision is the cut-off date for the requirement to conduct "surveys prior to habitat-disturbing activities." In other words, once the decision is made no additional survey requirements are imposed; no NEPA analysis will have to be re-done and no decisions will have to be re-made because of additional survey requirements.

The date of the decision is the signing of the Decision Notice (for the BLM) or NEPA Decision (for the Forest Service). Grace periods for newly added species or increases in known range are described under Pre-Disturbance Survey Protocols above.

Application of Manage Known Sites Direction: Even though pre-disturbance surveys are completed prior to the NEPA decision or decision document, manage known site direction will typically be applied to additional sites of rare species incidentally discovered during other field work after the decision date but prior to sale dates (or for non-contract activities, actual on-the-ground application of work). Manage known site direction may also be applied to additional sites for uncommon species, depending upon factors such as the level of concern for persistence of the species and its habitat in and adjacent to the activity area.

Practical Pre-Disturbance Surveys

Identification of species for which surveys are practical is basic to helping define the categories of Survey and Manage. If pre-disturbance surveys are practical, the risk of inadvertent loss of undiscovered sites and the likelihood that management activities will be detrimental to meeting species persistence objectives can both be substantially reduced. Conducting practical pre-disturbance surveys also reduces the urgency to locate sites through the use of strategic surveys, at least as compared to species for which pre-disturbance surveys are not practical.

The criteria below define when pre-disturbance surveys are practical or not practical. In general terms, the criteria are designed so that surveys will be found to be practical if a reasonable effort would be likely to determine the presence of a species on a specific area, although the criteria themselves should be used in making the determination, and no quantitative standard is implied. Put another way, practicality of surveys generally relates to the ability to confidently answer questions about species presence through surveys, while avoiding unreasonable costs or spending unreasonable amounts of time. The definition of practical is intended to be comparable to that described in the Northwest Forest Plan Record of Decision as being not "difficult" (see Appendix J2 of the Northwest Forest Plan FSEIS, and pages C-5 and C-6 in the Northwest Forest Plan Record of Decision). However, it is not anticipated that these surveys will find every site.

Surveys prior to initiation of habitat disturbance are considered "practical" if all of the following criteria apply. Surveys prior to habitat-disturbing activities are considered not practical if any of these factors do not apply.

- The taxon appears annually or predictably, producing identifying structures that are visible for a predictable and reasonably long time.
- The taxon is not so minuscule or cryptic as to be barely visible.
- The taxon can authoritatively be identified by more than a few experts, or the number of available experts is not so limited that it would be impossible to accomplish all surveys or identifications for all proposed habitat-disturbing activities in the Northwest Forest Plan area needing identification within the normal planning period for the activity.
- The taxon can be readily distinguished in the field and needs no more than simple laboratory or office examination to confirm its identification.
- Surveys do not require unacceptable safety or species risks.
- Surveys can be completed in two field seasons (approximately 7-18 months).
- Credible survey methods for the taxon are known or can be developed within a reasonable time period (approximately 1 year).

Equivalent-Effort Pre-Disturbance Surveys

Equivalent-effort surveys are an option for Category B species in old-growth, if strategic surveys are not completed within five (5) years (see strategic survey direction under Category B). The Survey and Manage Record of Decision also specifies "equivalent-effort" surveys as mitigation for eight species of mollusks whose characteristics make detection during such surveys less likely and, therefore, do not qualify as practical. Equivalent-effort surveys are pre-disturbance surveys conducted similarly to practical surveys (to the same intensity and effort--usually one field season and no more than two), according to written Survey Protocols, and during the times when the likelihood of detecting the species is highest. Because species characteristics make detection less likely, however, equivalent-effort surveys are only designed to locate the species if it occurs in an identifiable condition during a reasonable survey time period (no more than two field seasons). The survey is an "equivalent effort" to practical surveys, with protocol adjusted to deal with the one or more of the factors described above that make determining presence of the species unlikely.

There are only two differences between equivalent-effort surveys and practical surveys. One difference is that equivalent-effort surveys may need to accommodate one or more of the practicality factors listed above. The other difference is that equivalent-effort surveys are not expected to meet the description of "likely to determine the presence" of a species because the characteristics of these species make finding sites less certain.

Strategic Surveys

Introduction

Strategic surveys gather information at the landscape, population, or site-specific scale to address questions that relate to identified objectives for each category and address the need to manage for a reasonable assurance of species persistence. Information provided by strategic surveys (as well as research and other information-gathering efforts) will help address fundamental questions of Survey and Manage species, including: is there a concern for persistence; is the species rare or uncommon; is the species closely associated with late-successional forests; what is the appropriate management for the species; and, do the reserve land allocations and other standards and guidelines of the Northwest Forest Plan provide a reasonable assurance of species persistence? Strategic surveys can also help refine habitat descriptions and define geographic range and information needs for future surveys, and could also provide important information on population status, life history, and habitat use. All of these questions are to be set in the context of the objectives of the Northwest Forest Plan, of which the Survey and Manage mitigation measure is but a part. Strategic surveys are prescribed for all categories.

Information from strategic surveys feeds into the adaptive management process described later in these standards and guidelines, provides information for the development of Management Recommendations and pre-disturbance Survey Protocols, and provides information to better focus subsequent strategic surveys if needed. Strategic surveys provide information required in order to change species categories or remove them from Survey and Manage. These surveys also provide information to help establish or confirm direction for managing known sites, identifying high-priority sites, and conducting pre-disturbance surveys. Finally, for species with very few sites, strategic surveys may be the primary method for finding additional sites. Strategic surveys are different from "pre-disturbance surveys" (described earlier in these standards and guidelines) because they are focused on gathering information about the species and its habitat needs range-wide, and are not focused on determining presence or absence in specific areas prior to habitat-disturbing activities.

Various scales of strategic surveys are described below. The appropriate scales to be used, and the type of information to be gathered, are determined by the needs of each species and the needs or objectives suggested by the category to which they are assigned. However, strategic surveys are envisioned as "samples" with sampling intensity dependent upon information needs and the characteristics of the species and the habitat. The information to determine range, habitat associations, distribution, ability to survey for, and meet other strategic survey objectives is expected to come from a series of samples distributed on the landscape. Once surveys have reasonably established those parameters, or further surveys are not expected to contribute significant additional information toward those objectives, strategic surveys may be considered completed. For some very rare species, this means strategic surveys may be complete even if few or no additional sites are found. The long-term benefit to Survey and Manage species comes from continuing to apply other Survey and Manage Standards and Guidelines over time, not continuing to do strategic surveys indefinitely.

Identifying Information Needs and Priorities

The first step toward identifying strategic survey needs is the identification of the persistence and management questions for each species. Three primary questions guide this process:

1. What are the primary concerns for species persistence?
2. How do we manage species and habitats to ensure species persistence?
3. Does the species need the Survey and Manage Standards and Guidelines to provide a reasonable assurance of persistence?

For planning purposes, information needs can be: (1) divided into species range and habitat associations; (2) to improve and direct species and habitat management; or, (3) directly relevant for dealing with specific persistence concerns. Information needs are compared with existing information (e.g., in ISMS and published literature) to determine current state of knowledge and to identify information gaps. These information gaps are considered in the context of existing management direction (e.g., what is the level of concern for persistence under other elements of the Northwest Forest Plan and within the present Survey and Manage category), to set the biological priorities for strategic surveys. Priorities are also determined by how the information may be used to increase management efficiency. If answers to these questions may lead to species changing categories or being removed from Survey and Manage, there is a benefit in reduced activity costs and reduced impacts to other forest management activities. Both the biological priorities and the management efficiency benefits must be described or quantified for display in the Strategic Survey Implementation Guide (see below) for use by management for setting survey priorities.

Strategic Survey Methods and Scales

Strategic Surveys may be accomplished through various methods, such as acquiring information from field surveys, herbaria, museums, literature, field units and other sources, and using various analytical tools such as building and validating habitat models. These methods are explored,

developed, and analyzed for effectiveness and efficiency for acquiring the needed information. The selection of one or more of these methods depends, at least in part, on the scale that will best address the information need. The different approaches to strategic surveys will consider the contributions of various scales of surveys generally characterized as:

Broad-scale surveys designed to:

- Include multiple species.
- Provide information on species occurrence, distribution, range, and habitat associations.
- Address different Survey and Manage questions by stratifying the survey area into significant ecological or geographical units such as forest age class (e.g., young stand vs. old-growth) or land allocations (e.g., Late-Successional Reserves vs. Matrix lands).
- Refine habitat characterization.

Mid- to fine-scale surveys designed to:

- Refine habitat characterization.
- Provide information on how to manage species or their habitat, particularly at known sites.
- Provide information for the identification of high-priority sites for management.

Detailed studies (linked to research as appropriate) and other surveys designed to:

- Address specific questions and information needs (e.g., determining whether a species is still extant at a specific location, or conducting studies to examine specific disturbance effects on persistence of individuals at a site).

Species or surveys may be grouped for cost efficiency. Preliminary identification of available resources, including the administrative levels that will participate, is also a consideration.

Strategic Survey Implementation Guide

A Strategic Survey Implementation Guide displaying the known strategic survey needs for all species or species groups will be developed at the range-wide or regional scale, and generally be updated annually to reflect changes in information and priorities resulting from the previous years accomplishments or new information. The Strategic Survey Implementation Guide is, of necessity, dynamic, particularly during the first years while information needs are clarified. Additionally, changes to categories or other new information will lead to new questions. The plan, with annual updates, will help ensure deadlines listed in these standards and guidelines are met and identify the magnitude and likely duration of the strategic survey program (at least for currently known information needs) for planning and scheduling purposes. The document will help focus annual work planning on the priority information needs, provide information for long-range planning, and facilitate the grouping of surveys for efficiency. The Strategic Survey Implementation Guide is subject to review by the RIEC to ensure identified information needs and priorities will further the objectives of the Northwest Forest Plan.

The Implementation Guide will include, by species or taxa group:

- A summary of the information needs proposed to be answered by the strategic survey.
- The benefits expected by answering each identified need, either in terms of increased assurance of species persistence or reduced costs or impacts.
- Identification of methods (and scale) that would best meet the information needs.
- Relative priorities or priority-setting criteria. Management will set relative priorities or describe priority-setting criteria using the other three elements (and within expected resource availability).

Implementation and Responsibility

Responsibility for the design and coordination of strategic surveys rests with the regional offices of the Forest Service and state offices of the BLM, in collaboration with the U.S. Fish and Wildlife Service and Research Agencies, to ensure consistency, and because strategic surveys are generally intended to address information across a species range within the Northwest Forest Plan area. Coordination with both research agencies and field units regarding new information, assistance for design and conduct of surveys, identification of management needs, and availability of needed resources is important as well. Survey design should build upon or complement previous strategic, extensive, or general regional surveys whether conducted at the regional or local scale. Responsibility for implementation and follow-up actions may be delegated to administrative units or groups of administrative units, particularly where the range of a species is essentially confined to those units or the units are in a better position to assemble appropriate resources. Implementation includes all aspects of the planning and conduct of surveys, research, or other information-gathering activities. This may include hiring of personnel, mobilizing crews, contracting, selecting survey sites, scheduling site visits, developing protocols, etc.

Information from strategic surveys (and other sources) is maintained primarily in the Interagency Species Management System (ISMS) database and on species distribution maps.

Analysis and Use of Results

Information from strategic surveys is used in the Species Review Process (see Exhibit B and the Adaptive Management sections of these standards and guidelines), is incorporated into Management Recommendations and pre-disturbance Survey Protocols, and becomes part of the "existing information" used in the future identification of information needs and priorities described above. All three of these uses may lead, directly or indirectly, to the need for additional information. Information from completed surveys, and the identification of new survey needs, will be incorporated into the Strategic Survey Implementation Guide as appropriate.

Specific objectives of strategic surveys vary by category, species, and management need. Strategic surveys for a species are considered to be complete when any one of the following four conditions apply, and the resultant information has been compiled and analyzed, as appropriate, and presented in the appropriate form for use by the target audience. This form may range from inputting the data into ISMS for use during the Species Review Process to preparing a summary of the data and related Management Recommendations to assist project planners. The four conditions are:

1. The objectives of the strategic surveys (such as specific information needs) have been accomplished and information is sufficient to conclude that existing or resultant management direction will provide a reasonable assurance of persistence.

2. The objectives of the strategic surveys (such as specific information needs) have been accomplished and further surveys are not likely to contribute additional significant information about distribution, relative rarity, range, habitat associations, how to conduct pre-disturbance surveys, or other strategic survey objectives.

3. Adequate sites or habitats for the species have been located and are appropriately managed to provide reasonable assurance of persistence for the species.

4. For species with very limited habitat, all known potential habitat of the species has been surveyed, and there is little likelihood that additional undiscovered sites of the species will be located by further surveying.

Strategic survey accomplishments will be summarized in the Survey and Manage Annual Report.

VII. Reports, Monitoring, and Review

Annual Status Reports

An interagency, Northwest Forest Plan area-wide annual status report (the annual report), will be prepared to display progress and identify products resulting from implementation of these standards and guidelines. The report will include, at a minimum, results of adaptive management changes, status of Management Recommendations and Survey Protocols, a summary of the Strategic Survey Implementation Guide (including the status of strategic surveys), status and results of ongoing monitoring, and important new management direction. This report is the primary tool for the public to find out about annual changes to species assignments and resultant application of surveys to Agency activities. The Agencies will establish a mailing list for all persons wishing to receive all or a part of this report. Until and unless the Agencies identify and publish an alternative source, such requests should be addressed to the Interagency Survey and Manage Program Manager, c/o Regional Ecosystem Office, P.O. Box 3623, Portland, OR 97208-3623.

Monitoring

The primary objective of monitoring relative to Survey and Manage species is to evaluate progress toward meeting species persistence objectives. Monitoring for the Survey and Manage Standards and Guidelines will continue to follow the monitoring direction included in the Northwest Forest Plan and will be further defined and adapted to the new categories described in these standards and guidelines. Modifications will build upon new information identified in the November 2000 Survey and Manage FSEIS and compiled in future years during the annual Species Review Process. Sources of new information that will contribute to monitoring, and help identify the specific monitoring questions, include pre-disturbance and strategic surveys, as well as publications, research results, public, academia, and other sources.

The Northwest Forest Plan Record of Decision monitoring section at pages E-4 through E-10 identifies three types of monitoring:

1. Implementation monitoring for the Northwest Forest Plan began in 1996 and has been conducted annually. Future Northwest Forest Plan implementation monitoring protocols will be revised as needed to fully cover these standards and guidelines.

2. Effectiveness monitoring for Survey and Manage is expected to be most appropriately addressed as part of the Biological Diversity effectiveness monitoring (as described in the Northwest Forest Plan Record of Decision, page E-8) and will focus on multiple species and habitat relationships. Also some of the special monitoring issues and situations discussed on pages E-10 and 11 are particularly relevant.

3. Validation monitoring questions described in the Northwest Forest Plan that relate to Survey and Manage substantially overlap with the questions that strategic surveys are designed to address. Strategic surveys and the annual analysis that is part of the Species Review Process are generally expected to contribute substantially to meeting validation monitoring objectives.

Review by the Regional Ecosystem Office

Three documents are referenced in these standards and guidelines: Management Recommendations, Survey Protocols, and Strategic Survey Implementation Guide. Each document plays an important role in accomplishing Survey and Manage objectives. As described for the particular document elsewhere in these standards and guidelines, they are typically written for the species range. The documents are the responsibility of management working closely with taxa experts; they are developed by taxa experts and land managers (at any administrative level) for use at field offices of the BLM and Forest Service. New or revised versions of these documents

are subject to review by the REO to ensure they identify and integrate the habitat or life-history factors key to managing the species to the level of protection intended in the standards and guidelines. Other processes (e.g., exceptions to management of known sites, changes in categories resulting from the annual species analysis) are also subject to REO (or RIEC) review as described in these standards and guidelines. The REO or RIEC may develop criteria to exempt certain documents or processes from review.

"Subject to review by the Regional Ecosystem Office" means review is required unless the REO has specifically provided an exemption. As described in the Northwest Forest Plan Standards and Guidelines, page E-16, the REO provides staff work and support to facilitate RIEC decisions. Although the standards and guidelines refer to REO review, it is understood that the REO recommends to the RIEC who has responsibility for the decisions. The RIEC may delegate responsibility to complete these reviews.

VIII. Additional Mitigation Measures

Manage Sites Known as of September 30, 1999, for Two Mollusk Species

For two mollusk species, *Megomphix hemphilli* south of Lincoln, Benton, and Linn Counties in Oregon, and *Monadenia churchi*, sites known as of September 30, 1999, will be managed as known sites.

Equivalent-effort Surveys for Eight Mollusk Species

Eight mollusk species, *Ancotrema voyanum, Deroceras hesperium, Helminthoglypta hertleini, Hemphillia pantherina, Monadenia chaceana, Monadenia fidelis klamathica, Monadenia fidelis ochromphalus,* and *Pristoloma articum crateris*, are not considered practical to survey for, but require equivalent-effort pre-disturbance surveys. Equivalent-effort surveys for five of the eight species will simply continue to follow the Survey Protocols previously in use under Category 2 of the Northwest Forest Plan. The development of Survey Protocols for the other three (*A. voyanum, M. f. klamathica,* and *M. f. ochromphalus*) would normally fall under the survey protocol phase-in language in these standards and guidelines, but since these species are rare, have limited ranges, and habitat-disturbing activities are limited only to grazing (see note at the end of Management Recommendations section), the Agencies are directed to prepare survey protocols and initiate surveys as soon as practicable.

Duration of Additional Mitigation

These two (2) additional mitigations for the 10 mollusks are to remain in effect until:

- For the two species receiving manage known sites as of September 30, 1999, continue this mitigation as long as they remain in Category F.

- For the eight (8) species receiving equivalent-effort surveys, continue this mitigation as long as the species remain in Categories B or E and strategic surveys are not completed. If species are still in Categories B or E when strategic surveys are completed, and information about these species, analyzed and considered through the Species Review Process, indicates the three management elements of *manage known sites*, *practical pre-disturbance surveys*, and continued *strategic surveys* will not provide a reasonable assurance of persistence, this mitigation will be retained.

The above conditions rely on the Species Review Process as described in the standards and guidelines, including its' criteria for defining categories and defining concern for persistence. Like the process for changing species between categories, the above conditions and criteria are well defined and are expected to be implemented without further NEPA analysis.

IX, X, XI. Omitted

XII. Former Protection Buffer Species Without Management Recommendations

For former Protection Buffer species included in Survey and Manage but without approved Management Recommendations, management of known sites will follow the former Northwest Forest Plan Protection Buffer direction (except no LSRs or MLSAs are created), latest information (including that displayed in the November 2000 Survey and Manage FSEIS), and best professional judgment until a Management Recommendation is approved. Listed below is the former Protection Buffer direction for the five affected species: great gray owl and Del Norte, Siskiyou Mountains, Larch Mountain, and Shasta salamanders. This direction will be replaced with Management Recommendations prepared according to the Management Recommendations standards and guidelines.

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. However, it is also 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 and establish 1/4-mile protection zones around known nest sites. Within one year of the signing of the [1994 NWFP] 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.

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 high-lead cable systems to avoid disturbance of the talus layer. The implementation schedule for this species is the same as for [1994 NWFP] survey and manage components 1 and 2.

Siskiyou Mountain Salamander: This species occurs within an extremely narrow range on the Rogue River, Siskiyou, and Klamath National Forests. Its range does not fall within any of the Habitat Conservation Areas identified by the Interagency Scientific Committee in Oregon. Additional surveys conducted using a standardized protocol must be undertaken to delineate range and identify subpopulations. All populations must be protected by delineating an occupied site and avoiding disturbance of talus throughout the site, especially on moist, north-facing slopes, particularly in Oregon where Habitat Conservation Areas do not incorporate species' range. Because this species seems to require cool, moist conditions, a buffer of at least the height of one site-potential tree or 100 feet horizontal distance, whichever is greater, surrounding the site, must be retained around the outer periphery of known sites. Overstory trees must not be removed within the boundary of this buffer. The implementation schedule for this species is the same as for [1994 NWFP] survey and manage components 1 and 2.

Del Norte Salamander: This species occurs in talus slopes protected by overstory canopy that maintains cool, moist conditions on the ground. The species is a slope-valley inhabitant, and sometimes occurs in high numbers near riparian areas. Riparian Reserves, in combination with Late-Successional Reserves and other reserves, will offer some protection to the species but significant numbers also occur in upland areas. Additional mitigation options in this upland matrix include identifying locations (talus areas inhabited by the species) by using a standardized survey protocol [no longer required; the species is in Category D], then protecting the location from ground-disturbing activities. Designate a buffer of at least the height of one site-potential tree or 100-feet horizontal distance, whichever is greater, surrounding the location. Within the site and its surrounding buffer, maintain 40 percent canopy closure and avoid any activities that would directly disrupt the surface talus layer. Partial harvest within the buffer may be possible if 40 percent canopy closure can be maintained; in such cases, tree harvest must be conducted using helicopters or high-lead cable systems to avoid compaction or other disturbance of talus.

Shasta Salamander: This species is very narrowly distributed, occurring only in localized populations on the Shasta-Trinity National Forest. Only a small part of its range is included within Habitat Conservation Areas identified by the Interagency Scientific Committee (1990) (status within Late-Successional Reserves has not been determined). It occurs in association with limestone outcrops, protected by an overstory canopy. All known and future localities must be delineated and protected from timber harvest, mining, quarry activity, and road building within the delineated site, and a buffer of at least the height of one site-potential tree or 100 feet horizontal distance, whichever is greater, should surround the outcrop. Additional surveys conducted using a standardized protocol must be undertaken to identify and delineate all occupied sites within the species' potential range.

Appendix 2

The following table presents a brief comparison of the Survey and Manage Standards and Guidelines, the BLM Special Status Species Program, and the Forest Service Sensitive Species Program. This table is for general comparisons only. Details of each Agency's programs are available in their respective manuals, 6840 for BLM, 2600 for Forest Service. Details of all three programs can be found on Agency websites available through http://www.or.blm.gov/surveyandmanage/.

	Special Status Species (SSS)		**Sensitive Species (SS)**	
Survey and Manage	**BLM OR/WA**	**BLM CA**	**Forest Service Region 6**	**Forest Service Region 5**
Geographic Area Affected				
NWFP area WA, OR, CA	BLM lands in Oregon and Washington	BLM lands in California	National Forests in Oregon and Washington	National Forests in California
Number of Categories				
Six categories: Based on level of rarity, ability to do pre-disturbance surveys, and level of knowledge.	Three Categories: 1. Sensitive (BS) (National) 2. Assessment (BA) (OR/WA supp.) 3. Tracking (BT) (OR/WA supp., not considered SSS for management purposes)	One category: Sensitive (BS) (National)	One category: Sensitive (SS) (National)	Two Categories: 1. Sensitive (SS) (National) 2. Watch List (R5 supp.).
Taxa Currently Included				
Birds Mammals - Amphibians - Bryophytes - Mollusks Arthropods guilds (4) Vascular plants Fungi Lichens	Birds Mammals Fish Amphibians Reptiles Bryophytes Invertebrates including Mollusks Arthropods Vascular plants Fungi Lichens	Birds Mammals Fish Amphibians Reptiles Bryophytes Invertebrates including Mollusks Arthropods Vascular plants Fungi Lichens	Birds Mammals Fish Amphibians Reptiles - Invertebrates including Mollusks - Vascular plants Fungi Lichens	Birds Mammals Fish Amphibians Reptiles Bryophytes Invertebrates including Mollusks - Vascular Plants Fungi Lichens

Criteria for Inclusion Descriptions of the state and global rankings and how they relate to Oregon Natural Heritage Program rankings are in Appendix 3.				
Meet all three: 1. The species must occur within the NWFP area; 2. The species must be closely associated with late-successional or old-growth forests; 3. The reserve system and other standards and guidelines of the NWFP do not appear to provide for a reasonable assurance of species persistence.	BS-Animals: ONHP Category 1, ODFW Critical, or WDFW Sensitive. BS-Plants: ONHP Category 1, ODA Candidate, or WDNR Threatened or Endangered. BA-Animals: ONHP Category 2 vertebrates only, or some ODFW Peripheral. BA-Plants: ONHP Category 2 (no fungi) or WDNR Sensitive. BT-Animals: ONHP Categories 3 or 4; ODFW Vulnerable, Rest of Peripheral, or Undetermined; or WDFW Candidate or Monitor. BT-Plants: ONHP Categories 3 or 4; WDNR Review, Watch, Extinct/Extirpated; or State status 1, 2, or 3. State Director may also add species nominated by District Managers. Species only included if BLM has capability to significantly affect the conservation status through management.	BS-Animals: Identified in coordination with CDF&G. BS-Plants: California Native Plant Society List 1-B. Species only included if BLM has capability to significantly affect the conservation status through management	SS-Animals and fish: Federal ESA candidate species; Natural Heritage Rank G1, G2, G3, T1, T2, T3, N1, N2, N3, S1 or S2; Designated by OR or WA State as threatened or endangered; de-listed from ESA within last 5 years; or anadromous fish populations or ESUs identified in Region-wide status review by fishery and TES biologists as needing special management status, unless a compelling case is made not to add it. A species not meeting criteria may be included if adequate rationale and documentation demonstrates species' biological, rarity, or management concerns. SS-Vascular Plants: Natural Heritage Rank G1, G2, G3, T1, T2, T3, or Species rank S1, S2, or S3 if evaluation using six factors (abundance, range, trend, protection, threat, and fragility) is high enough.	SS-Animals and fish: Federal ESA candidate or proposed species; Natural Heritage Rank G1, G2, G3, T1, T2, T3, N1, N2, or N3; or designated by CA as threatened and endangered species. SS-Vascular Plants: Federal ESA candidates, or Natural Heritage global ranking of G1, G2, G3, T1, T2, or T3 and life history facts are gathered by a team of botanists for evaluation for viability concerns or trends toward federal listing. Evaluation includes: abundance, range/ distribution, trend, protection of occurrences, threat, and fragility/habitat specificity. Include only if FS management activities have potential to affect, and enough is known about species and habitat to evaluate management effects.

Objectives of the Program				
All: Manage for the persistence of species closely associated with late-successional and old-growth forests.	BS: Manage to ensure that actions do not contribute to the need to list under federal ESA.	BS: Manage to ensure that actions do not contribute to the need to list under federal ESA.	SS: Maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands. Manage to preclude trends toward federal listing.	SS: Maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on NFS lands. Manage to preclude trends toward federal listing.
Required Management Actions				
Categories A, B, and E: Manage all sites per Management Recommendation. Categories C and D: Manage high-priority sites per Management Recommendation. Categories A and C: Conduct pre-disturbance surveys per Survey Protocol. All categories: Conduct strategic surveys. Documents, plans, and exceptions require review by the Regional Ecosystem Office.	BS: Develop and implement management plans that conserve species and their habitats and ensure actions authorized, funded, or carried out by BLM do not contribute to the need to list species under ESA. Ensure activities affecting habitat are consistent with species management objectives. Conduct pre-disturbance surveys for actions that would have significant effect on habitat needed to conserve species. Conduct distribution and status surveys. BA: None. Species are considered on case-by-case basis in NEPA process. BT: None.	BS: Develop and implement management plans that conserve species and their habitats. Ensure actions authorized, funded, or carried out by BLM do not contribute to the need to list species under ESA. Ensure activities affecting habitat are consistent with species management objectives. Conduct pre-disturbance surveys for actions that would have significant effect on habitat needed to conserve species. Conduct distribution and status surveys.	SS: Develop and implement management objectives for populations and/or habitat. Biological Evaluations must be completed for projects possibly affecting species, and include an analysis of the effects of the proposed action on species, their occupied habitat, or on any unoccupied habitat required for recovery.	SS: Develop and implement management objectives for populations and/or habitat. Biological Evaluations must be completed for projects possibly affecting species, and include an analysis of the effects of the proposed action on species, their occupied habitat, or on any unoccupied habitat required for recovery.

What happens once we find one?				
Categories A, B, and E: Manage all sites per Management Recommendation. Categories C and D: Manage high-priority sites per Management Recommendation. Exceptions permitted with review by the Regional Ecosystem Office if documented as not needed for persistence.	BS: Analyze effects of the proposed action on potentially affected species. Request technical assistance, if appropriate, from FWS, NOAA Fisheries, or other qualified sources. Avoid taking actions that would contribute to the need to list under the ESA. BA: Species are recommended for analysis and management contingent on district budget, expertise and "in balance with other resource considerations." Impacts considered on case-by-case basis in NEPA process. BT: Collection of occurrence data is encouraged and reported if observed. Not considered SSS for management purposes.	BS: Analyze effects of the proposed action on potentially affected species. Request technical assistance, if appropriate, from FWS, NOAA Fisheries, or other qualified sources. Avoid taking actions that would contribute to the need to list under the ESA.	SS: The Biological Evaluation analyzes the proposed action and the significance of potential adverse effects on the population or its habitat within the area and on the species as a whole, and makes recommendations for removing, avoiding, or compensating for any adverse effect. The line officer with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward federal listing.	SS: The Biological Evaluation analyzes the proposed action and the significance of potential adverse effects on the population or its habitat within the area and on the species as a whole, and makes recommendations for removing, avoiding, or compensating for any adverse effect. The line officer with project approval authority makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward federal listing.

Influence on Agency Management				
Management of occupied sites required regardless of local population, significance of habitat, or objective of conflicting activity.	May conduct other activities on some known sites. Must manage to avoid moving the species significantly toward listing. Species only included if BLM has capability to significantly affect the conservation status of the species through management.	May conduct other activities on some known sites. Must manage to avoid moving the species significantly toward listing. Species only included if BLM has capability to significantly affect the conservation status of the species through management.	May conduct other activities on some known sites. Biological Evaluation necessary to show loss of site or habitat will not result in loss of species viability or create significant trends toward federal listing. Species only included if sufficient information is available on habitat relationships, life history, etc., to evaluate potential effect.	May conduct other activities on some known sites. Biological Evaluation necessary to show loss of site or habitat will not result in loss of species viability or create significant trends toward federal listing. Species only included if sufficient information is available on habitat relationships, life history, etc., to evaluate potential effect.
How Changes are Made				
To move species: annually, examine new information, take recommendations from taxa specialists, and compare species information against criteria for category. Changes subject to review by the RIEC, and issued by the Regional Forester/State Director. SEIS required to change categories or process.	State Office updates species lists periodically; changes are effective when the state agencies and OHNP publish their updates. BLM Director could change National direction (BS). State Director could change OR/WA Supp. (BA and BT).	State Office updates species lists periodically; changes are effective when the state agencies and OHNP publish their updates. BLM Director could change National direction (BS). State Director could designate additional categories.	Revisions to species lists made periodically as information and demand warrant. Species and taxa groups to include are purview of Regional Forester. Change in sensitive species direction would require national Forest Service Manual change.	Sensitive species list is dynamic and updated on a 2-3 year cycle. Change in Sensitive species direction would require national Forest Service Manual change.

BA = BLM Assessment
BS = BLM Sensitive
BT = BLM Tracking
CDF&G = California Department of Fish and Game
ESA = Endangered Species Act
ESU = Ecologically Significant Unit
FWS = U.S. Fish and Wildlife Service
NFS = National Forest System
NOAA Fisheries = National Marine Fisheries Service
ODA = Oregon Department of Agriculture
ODFW = Oregon Department of Fish and Wildlife
ONHP = Oregon Natural Heritage Program
SS = FS Sensitive Species
Supp. = Mannual Supplement
TES = Threatened, Endangered, or Sensitive
WDFW = Washington Department of Fish and Wildlife
WDNR = Washington State Department of Natural Resources
WNHP = Washington Natural Heritage Program

Appendix 3
State and Global Rankings Definitions

Definition of Global and State Rankings Assigned by the Oregon Natural Heritage Program, and Additional Information about the Washington and California Rankings

The following rankings information was excerpted from pages 4 and 5 of Rare, Threatened, and Endangered Plants and Animals in Oregon, Oregon Natural Heritage Program, February 2001. This ranking information can be found on the internet at http://oregonstate.edu/ornhic/tebook.pdf. More details on the Heritage Ranking system and more definitions can be found at the NatureServe website at http://www.natureserve.org/ranking.htm.

The criteria for the Oregon Natural Heritage Program (ONHP) lists are as follows:

List 1 contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders. They can be very significant when protecting the genetic diversity of a taxon. ONHP regards extreme rarity as a significant threat and has included species which are very rare in Oregon on this list.

List 3 contains species for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 contains taxa which are of conservation concern but are not currently threatened or endangered. This included taxa which are very rare but are currently secure, as well as taxa which are declining in numbers or habitat but are still too common to be proposed as threatened or endangered. While these taxa currently may not need the same active management attention as threatened or endangered taxa, they do require continued monitoring.

ONHP participates in an international system for ranking rare, threatened, and endangered species throughout the world. The system was developed by The Nature Conservancy and is now maintained by The Association for Biodiversity Information (ABI) in cooperation with Heritage Programs or Conservation Data Centers (CDCs) in all 50 states, 4 Canadian provinces, and 13 Latin American countries. The ranking is a 1-5 scale, primarily based on the number of known occurrences, but also including threats, sensitivity, area occupied, and other biological factors. In this book, the ranks occupy two lines. The top line is the Global Rank and begins with a "G." A "T" rank indicates the taxon has a trinomial (a subspecies, variety, or recognized race). A "Q" at the end of this line indicates the taxon has taxonomic questions. The second line is the State Rank and begins with the letter "S". The rankings are summarized below.

1 = Critically imperiled because of extreme rarity or because it is especially vulnerable to extinction or extirpation. Typically 5 or fewer occurrences.
2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation). Typically 6-20 occurrences.
3 = Rare, uncommon, or threatened. Not immediately imperiled. Typically 21-1,000 occurrences.
4 = Not rare and apparently secure with cause for long-term concern. Usually more than 100 occurrences.
5 = Demonstrably widespread, abundant, and secure.
H = Historical occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered.
X = Presumed extirpated or extinct.
U = Unknown rank.
? = Not yet ranked or assigned rank is uncertain.

Since BLM uses the ONHP categories and the Forest Service uses the Global and State rankings, it is important to understand the relationship between the two in order to make comparisons. Natural Heritage Programs determine global and state rankings, and then consider these rankings to compile their own "list." ONHP and Washington (WNHP) use the Conservation Status Ranking system developed by the Network of State Natural Heritage Programs (NHPs) and CDCs. NHP ranks a species at a variety of levels: global (G1-5), taxon (T1-5), national (N1-5), and state (S1-5). The ranks are based on objective information about each taxon/element for a number of criteria including estimated number of individuals, extent of range or habitat, population trends, occupied habitat, threats, and other considerations.

ONHP considers the NHP ranking at each level and places a taxon/element into one of four categories relative to Oregon. This four-category system is used only in Oregon, California, and Hawaii. The system allows for further refinement of the national list based on local knowledge. For example, a species known only in four locations in Oregon would be ranked G-1. However, ONHP biologists may be aware that these four locations are in Wilderness with no anticipated threats. This species would be placed in a "lesser" category to maintain an awareness and monitoring of the population would continue.

The WNHP considers the national rankings for their listings, but also considers Washington State Department of Natural Resources and Department of Fish and Wildlife input in their rankings. For example, rare species in Washington may be included on the WNHP endangered list (list 1), even though the species is common in Oregon. WNHPs list categories are endangered, threatened, sensitive, and watch.

For California, BLM uses the California Native Plant Society List 1B to help identify sensitive plants. The following description of the California Native Plant Society lists is from their website. The table below shows the five different levels of rarity recognized by the Rare Plant Program.

Comparison of Oregon Natural Heritage Program (ONHP) List and Global/State Rankings	
ONHP Ranking (List)	**Global/State Ranking included**
1 - considered threatened or endangered[1]	G1, G2, some G3 depending upon threats and other information
2 - considered threatened or endangered in Oregon	S1, S2, some S3 depending upon threats and other information
3 - Review list, may be threatened but insufficient information	
4 - watch, of concern but currently appear abundant or secure	
Not on list	S4, S5, and some S3

[1] Not the same as state or federal threatened or endangered.

List	Inventory, 6th Edition (2002)	# taxa	% of CA natives
1A	Presumed extinct in California	29	0.4
1B	Rare or endangered in California and elsewhere	1,021	16.2
2	Rare or endangered in California, more common elsewhere	417	6.6
3	Need more information	52	0.8
4	Plants of limited distribution	554	8.8
Total		2,073	32.9

Appendix 4

Proposed
STANDARDS AND GUIDELINES

for Alternative 3 of this SEIS

April 2003

Draft Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines

Lead Agencies: **Forest Service - U.S. Department of Agriculture**
Bureau of Land Management - U.S. Department of the Interior

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TABLES

Omitted. However, the current species placements by Survey and Manage category are shown on Table 2-8 at the end of Chapter 2. If Alternative 3 is selected in the Record of Decision, all tables will be included at that time.

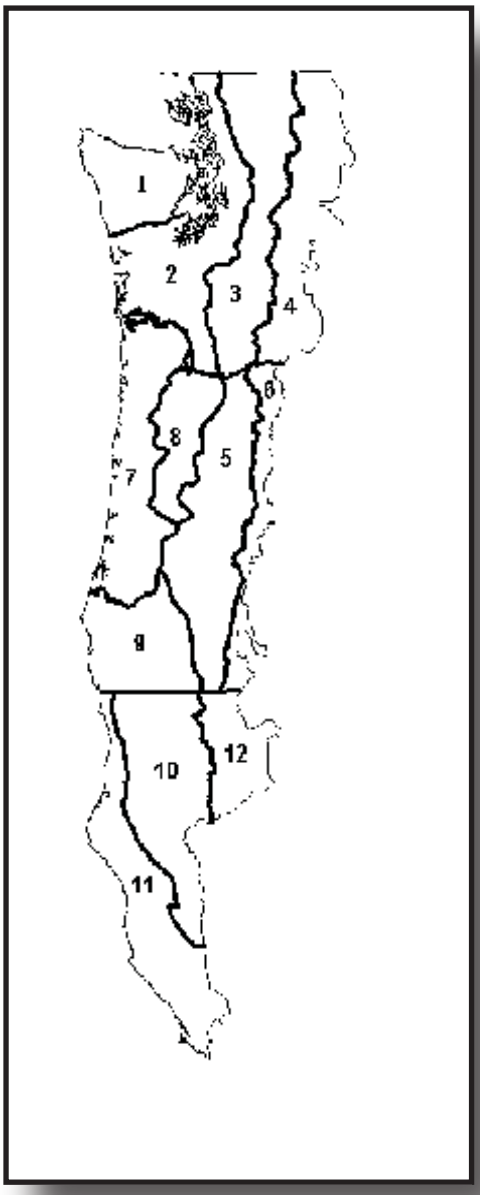
Proposed STANDARDS AND GUIDELINES for Alternative 3 of the 2003 SEIS

All sections of this document are the complete compilation of standards and guidelines for Alternative 3 in this (2003) SEIS.

I. Introduction

Proposed Standards and Guidelines

If Alternative 3 is selected in the Record of Decision, it would amend the standards and guidelines in the January 2001 Record of Decision for Amendments to the Survey and Manage, Protection Buffers, and other Mitigation Measures (hereafter referred to as Survey and Manage Standards and Guidelines). The existing standards and guidelines would be replaced by the standards and guidelines described below. Sections IX, X, and XI of the 2001 Standards and Guidelines are not included here because they were not part of the Survey and Manage Standards and Guidelines. Those sections deal with certain cavity-nesting birds, Canada lynx, and some bat roosts. Those sections are not proposed for removal or modification by Alternative 3 or any other alternative in this (2003) SEIS.



Other elements of the Northwest Forest Plan not specifically addressed, and implementation memos and other policy interpretations not affected by changes in these standards and guidelines, are not changed. Exceptions to certain standards and guidelines for research or the Adaptive Management Process described in Chapter E of the Northwest Forest Plan Standards and Guidelines, for example, continue to apply to Survey and Manage as under the Northwest Forest Plan Record of Decision.

Physiographic Provinces

The 1994 Northwest Forest Plan Standards and Guidelines include two different province maps: physiographic provinces and planning provinces. The map of the 12 physiographic provinces appears on page A-3 of the Northwest Forest Plan Standards and Guidelines and is repeated here for reference (see adjacent figure). The physiographic provinces allow differentiation between areas of common biological and physical processes. Unless otherwise identified, references to “provinces” in these standards and guidelines are to physiographic provinces.

The 12 physiographic provinces are:

1. WA Olympic Peninsula
2. WA Western Lowlands
3. WA Western Cascades
4. WA Eastern Cascades
5. OR Western Cascades
6. OR Eastern Cascades
7. OR Coast Range
8. OR Willamette Valley
9. OR Klamath
10. CA Klamath
11. CA Coast Range
12. CA Cascades

Species Removed from Survey and Manage and other Standards and Guidelines

Species formerly included on Survey and Manage that are removed only because they are not closely associated with late-successional or old-

growth forests (see Table 1) are already on, or are being considered for, the Agencies' special status species programs. Known sites for these species will be managed until their disposition is clarified under the special status species programs or a decision is documented not to include them. For all other species (including the 4 arthropod guilds) removed from the Survey and Manage mitigation measure, current "known sites" of these species are released for other resource activities.

Land Allocations

These standards and guidelines apply to all land allocations.

II. Survey and Manage Basic Criteria

The Survey and Manage three basic criteria (see box) must be met for a species to be included in the Survey and Manage Standards and Guidelines. Species no longer meeting these criteria will be removed from Survey and Manage. The process for adding or removing a species is described in the Adaptive Management section. The following section describes "persistence" and the criteria used to determine when there is concern for persistence.

Species Persistence Objectives

In general, these standards and guidelines are designed to help the Northwest Forest Plan provide for the persistence of late-successional and old-growth forest related species. Objectives for maintaining species persistence for these standards and guidelines are the same as those described in the Northwest Forest Plan 1994 Record of Decision. The objectives recognize that there is uncertainty associated with the continued persistence of species. Even absent any human-induced effects, the likelihood that habitat will continue to support species' persistence can vary among species. For example, the continued persistence of rare species, whose entire range may comprise only a few acres, is inherently at greater risk due to natural disturbance than species with larger ranges and more locations, when considered over the long term. Thus, the achievement of species persistence is not subject to precise numerical interpretation and cannot be fixed at any one single threshold (Northwest Forest Plan ROD, p. 44).

Three Basic Criteria for Survey and Manage

1. *The species must occur within the Northwest Forest Plan area, or occur close to the NFP area and have potentially suitable habitat within the NFP area.*
2. *The species must be closely associated with late-successional or old-growth forest (see Exhibit A).*
3. *The reserve system and other Standards and Guidelines of the Northwest Forest Plan do not appear to provide for a reasonable assurance of species persistence.*

Concern for Persistence

One of the basic criteria for applying the Survey and Manage mitigation measure to a species is concern for persistence. A concern for persistence exists when the reserve system and other standards and guidelines of the Northwest Forest Plan do not appear to provide a reasonable assurance of species persistence. Little or no concern for persistence exists when the reserve system and other standards and guidelines of the Northwest Forest Plan (other than Survey and Manage) provide a reasonable assurance of persistence. When this assurance of species persistence exists, the species may be removed from the Survey and Manage mitigation measure.

Criteria Indicating a **Concern for Persistence.** One or more of the following criteria, which are to be considered in the context of the reserve system and other standards and guidelines of the Northwest Forest Plan, may indicate

a concern for species persistence. These criteria must be considered aside from the Survey and Manage mitigation measure, and must apply within the Northwest Forest Plan area.

- Low number of likely extant known sites/records in all or part of a species range.
- Low number of individuals.
- Low number of individuals at most sites or in most populations.
- Very-limited range.
- Very-limited habitat.
- Distribution within habitat is spotty or unpredictable in at least part of its range.

Criteria Indicating **Little or No Concern for Persistence**. Usually, most of the following criteria need to be met to indicate that a concern for persistence does not exist. These criteria must apply within the Northwest Forest Plan area.

- Moderate-to-high number of likely extant sites/records.
- Moderate-to-high proportion of sites and habitat in reserve land allocations; or limited number of sites within reserves, but the proportion or amount of potential habitat within reserves is high and there is a moderate-to-high probability that the habitat is occupied.
- Sites are relatively well distributed or only partially restricted within the species range.
- Matrix Standards and Guidelines or other elements of the Northwest Forest Plan provide a reasonable assurance of species persistence.

Concern for persistence is based on existing knowledge and may change over time. While concern will remain for some species that are truly rare, the concern for many species will be alleviated as more information is accumulated through pre-disturbance and strategic surveys, and considered with the criteria indicated above. A species for which there is no longer a concern for persistence will be removed from the Survey and Manage mitigation measure as described in the adaptive management section.

III. Survey and Manage Categories

Introduction

Survey and Manage species are grouped into three categories (A, B, and E) as described below. The three categories are based on ability to reasonably and consistently locate occupied sites during surveys prior to habitat-disturbing activities and the level of information known about the species.

The three categories help delineate species objectives and apply specific management direction. The standards and guidelines describe the objective, assignment criteria, and management direction for each category.

The species included in the Survey and Manage mitigation measure, and the category to which each species, or portion of the range of each species, is assigned, is shown on Table 1, Species Included in Survey and Manage Standards and Guidelines and Category Assignment. (Note: this table has been omittted; however, category assignments are shown on Table 2-8 at the end of Chapter 2). The adaptive management section of these standards and guidelines define how to change species among the three categories and how to add or remove species from Survey and Manage, in response to new information.

Survey and Manage Categories and Management Requirements.		
Pre-Disturbance Surveys Practical	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Category A • Manage All Known Sites • Pre-Disturbance Surveys • Strategic Surveys	**Category B** • Manage All Known Sites • N/A • Strategic Surveys	**Category E** • Manage All Known Sites • N/A • Strategic Surveys

These standards and guidelines apply within all land allocations; however, the Survey and Manage mitigation measure for each species will be directed to the range (or portion of range) of that species, to the particular habitats where concerns exist for its persistence, and to the management activities considered "habitat-disturbing" for that species. The Survey and Manage Standards and Guidelines will benefit species closely associated with late-successional and old-growth forests including certain vertebrates, bryophytes, mollusks, vascular plants, fungi, and lichens. Information about these species, acquired through application of these standards and guidelines, should facilitate project planning and adaptive-management changes.

The category discussions include additional information that clarifies the linkage between objectives and management actions of each category and describes the criteria for assigning species to the various categories. A taxon, or range-defined portion of a taxon, can be assigned to only one category.

Category A (Pre-Disturbance Surveys Practical)

Objective: Manage all known sites and minimize inadvertent loss of undiscovered sites.

Criteria for assigning a species to Category A are:

- All known sites or population areas are likely to be necessary to provide reasonable assurance of species persistence, as indicated by one or more of the following:
  - Low number of likely extant sites/records on federally managed lands.
  - Species poorly distributed within its range or habitat.
  - Limited number of individuals per site.
  - Highly specialized habitat requirements (narrow ecological amplitude).
  - Dispersal capability limited relative to federally managed habitat.
  - Microsite habitat limited.
  - Reproduction or survival not sufficient.
  - Low number of sites in reserves or low likelihood of sites or habitat in reserves.
  - Habitat fragmentation that causes genetic isolation.
  - Factors beyond management under the Northwest Forest Plan affect persistence, but special management under the Northwest Forest Plan will help persistence.
  - Declining habitat trend.
- Pre-disturbance surveys are practical.

Management Direction:

Manage All Known Sites: Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS, and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations. (See glossary for definition of "known site.")

Professional judgment, coupled with locally specific information and advice from taxa specialists about the species, may be used to identify occasional sites not needed for persistence. Such exceptions must be approved by the line officer at the next level above the official responsible for the proposal.

Surveys Prior to Habitat-Disturbing Activities in Late-successional and Old-growth Forests: To avoid loss of undiscovered sites, surveys will be conducted at the project level prior to habitat-disturbing activities in late-successional and old-growth forest stands. Pre-disturbance surveys are not required for younger stands which have not yet become late-successional and/or old-growth forest. Surveys will be done in accordance with Survey Protocols. Species sites found as a result of these surveys will be managed as known sites.

Strategic Surveys: The objective of strategic surveys is to search for additional sites and to characterize the habitat, improving the ability of the Agencies to know where to survey and how to manage the species. These surveys will build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of these strategic surveys will be managed as known sites.

Strategic Surveys may address one or more of the following:

- Are known sites still extant?
- What is the habitat of the species?
- Identify high-probability habitat for surveys to find new sites.
- Where else does the species occur? Find new sites.
- Collect habitat information to assist with managing the species.
- What is the status of the population (such as number of individuals, size)?
- What is the distribution of the species relative to the land allocations established in the Northwest Forest Plan?

Category B (Pre-Disturbance Surveys Not Practical)

Objective: Manage all known sites and reduce the inadvertent loss of undiscovered sites.

Criteria for assigning a species to Category B:

- Same criteria as Category A, except that pre-disturbance surveys are not practical.

Management Direction:

Manage All Known Sites: Same as Category A.

Surveys Prior to Habitat-Disturbing Activities in Late-successional and Old-growth Forests: Generally, pre-disturbance surveys are only prescribed for species for which they are practical. Pre-disturbance surveys are not required for this category. However, "equivalent-effort" surveys were prescribed as a mitigation measure (USDA, USDI 2001) for four Category B mollusk species whose characteristics, such as small size and identifying characteristics, prevent them from being consistently located during site-specific surveys. To avoid inadvertent loss of undiscovered sites, "equivalent-effort" surveys will be conducted for four mollusk species prior to habitat-disturbing activities; equivalent-effort surveys would not be required in non-late-successional and non-old-growth forest stands. Equivalent-effort surveys will be done in accordance with Survey Protocols. Species sites found as a result of these surveys will be managed as known sites.

Strategic Surveys: The objective of strategic surveys in this category is to find additional new sites and to characterize the habitat, improving the ability of the Agencies to know where to survey and how to manage and conserve the species. To reduce the inadvertent loss of undiscovered sites, the Agencies will not sign NEPA decisions or decision documents for habitat-disturbing activities in old-growth forest (a sub-set of late-successional forest - see glossary) in fiscal year 2006 (fiscal year 2011 for fungi) and beyond, unless either:

- strategic surveys have been completed for the province that encompasses the project area, or
- equivalent-effort surveys have been conducted in the old-growth habitat to be disturbed.

Strategic surveys build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of strategic surveys will be managed as known sites. Strategic survey accomplishments, including completion by province, will be summarized in the annual report. "Old growth" is specified in this standard and guideline to assure retention of what is assumed to be the highest quality potential habitat for Survey and Manage species until strategic surveys are completed or equivalent-effort surveys are conducted. "Province" is specified as the geographic unit in which to assess completion of strategic surveys given that it represents

the smallest, logical, well-defined area for which the results of strategic surveys likely could be compiled, analyzed, and presented with meaningful results.

Strategic Surveys may address one or more of the following:

- Are known sites still extant?
- What is the habitat of the species?
- Identify high-probability habitat for surveys to find new sites.
- Where else does the species occur? Survey high-probability habitat at highest risk to find new sites.
- What is the distribution of the species relative to the land allocations established in the Northwest Forest Plan?
- Collect habitat information to assist with managing the species.
- What is the status of the population (such as number of individuals, size)?

Category E (Status Undetermined)

Objective: Manage all known sites while determining if the species meets the basic criteria for Survey and Manage and, if so, to which category (A or B) it should be assigned.

Criteria for assigning a species to Category E:

- The number of likely extant sites/records and survey information on federally managed lands indicates a concern for persistence.
- Information is insufficient to determine whether Survey and Manage basic criteria are met or to determine what management is needed for a reasonable assurance of species persistence.

Management Direction:

Manage All Known Sites: Current and future known sites will be managed according to the Management Recommendation for the species. Professional judgment, Appendix J2 in the Northwest Forest Plan Final SEIS (USDA, USDI 1994a), and appropriate literature will be used to guide individual site management for those species that do not have Management Recommendations.

Professional judgment, coupled with locally specific information and advice from taxa specialists about the species, may be used to identify occasional sites not needed for persistence. Such exceptions must be approved by the line officer at the next level above the official responsible for the proposal.

Surveys Prior to Habitat-Disturbing Activities in Late-successional and Old-growth Forests: Same as Category B, except equivalent-effort surveys are required for one mollusk species.

Strategic Surveys: The objective of strategic surveys in this category is to collect enough information to determine if the species meets the basic criteria for Survey and Manage, and to either place the species into the appropriate Survey and Manage category or remove the species from Survey and Manage.

Strategic surveys build upon and incorporate information from previous and ongoing surveys. Species sites found as a result of these surveys will be managed as known sites. In cases where the strategic survey indicates that there is still a concern for persistence, but the species is not closely associated with late-successional or old-growth forests, the species will be removed from Survey and Manage and considered for the Agencies' special status species programs.

Strategic Surveys may address one or more of the following:

- Is the species closely associated with late-successional and old-growth forests?
  - › Revisit known sites, characterize the species habitat, and find new sites.
- Does the species occur within the Northwest Forest Plan area?
  - › Survey potential habitat near known sites.
- What is the appropriate management for the species?
  - › Does the species meet the basic criteria for Survey and Manage?
  - › What is the appropriate Survey and Manage category?

IV. Adaptive Management Process

Introduction

The following adaptive management detail is designed to make the standards and guidelines efficient for the Agencies to implement and responsive to the needs of the species. The specific criteria for refining or changing species management are based on the strategies and objectives of the specific categories.

This process covers the acquisition, evaluation, and application of new information to move species between categories, remove species from Survey and Manage, add species to Survey and Manage, and develop or revise Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide. The process described here will not change the number of categories, their definition or objectives, or the specific defining criteria or management direction applicable to the categories. Changes of that type would fall under the general adaptive management discussion in the Northwest Forest Plan Record of Decision (pp. E-12 through E-15).

The adaptive management process for Survey and Manage Standards and Guidelines includes three steps:

1. Acquiring new information relative to Survey and Manage species.
2. Evaluating new information.
3. Implementing changes or refinements to Survey and Manage.

These three steps are described individually below.

Acquiring New Information Relative to Survey and Manage Species

New information concerning species status or needs, and efficiency of the standards and guidelines, will be generated mostly through strategic and pre-disturbance surveys and other implementation experience. The Agencies will use a data call, open conference, or other methods to gain new information about Survey and Manage species. Sources of new information may also include taxa experts, resource specialists, scientists, data from Agency surveys, research, members of academia, and other publics. This information is maintained primarily in the Interagency Species Management System (ISMS) database. New information may lead to: (1) adding, removing, or changing species assignments to Survey and Manage categories, as described below; (2) changes to Management Recommendations and Survey Protocols; and, (3) changes to information needs identified in the Strategic Survey Implementation Guide, as described in these standards and guidelines.

Evaluating New Information for Adding, Removing, or Changing a Species in Survey and Manage

A regional-level interagency group including taxa experts, meeting at least annually, will weigh new information against the criteria below to determine if additions or deletions of species from

Survey and Manage or changes of species among categories, are warranted (see the 2001 ROD, Attachment 1, Exhibit B). Partial information or proposals to add or change species will not obligate the Agencies to gather additional information.

New information presented for evaluation in considering changes to Survey and Manage should address the criteria described below, as appropriate. The basic criteria for Survey and Manage are key to the evaluation process when proposing to add, remove, or change a category.

Criteria for Adding Species to Survey and Manage

Species proposed for addition to the Survey and Manage Standards and Guidelines must be taxonomic entities published in appropriate peer-reviewed journals accepted by the scientific community and, based on currently available information, must meet all three of the basic criteria for Survey and Manage.

The new information to support addition of a species to Survey and Manage must address the three basic criteria including the specific factors used as a basis for determining concern for persistence. The factors must apply to at least an identified portion of the species range, on federally managed lands, within the Northwest Forest Plan area.

One or more of the following factors may indicate that persistence is a concern. These factors must be considered in the context of other standards and guidelines (other than those related to Survey and Manage) in the Northwest Forest Plan:

- Low number of likely extant known sites/records in all or part of species range.
- Low number of individuals.
- Low number of individuals at most sites or in most populations.
- Very-limited range.
- Very-limited habitat.
- The distribution of the species within habitat is spotty or unpredictable in at least part of its range.

Criteria for Removing Species from Survey and Manage

When new information indicates that a species no longer meets the Survey and Manage basic criteria, the species will be removed from the Survey and Manage Standards and Guidelines.

New information to support removing a species from the Survey and Manage Standards and Guidelines may address any one of the three Survey and Manage basic criteria. If a species is proposed for removal from the Survey and Manage Standards and Guidelines because there is not a concern for its persistence, the new information must address specific factors indicating that persistence is not a concern as listed below. The factors must apply to at least an identified portion of the species range, on federally managed lands, within the Northwest Forest Plan area.

Usually, most of the following factors must be true to indicate that persistence is not a concern:

- Moderate-to-high number of likely extant sites/records.
- Moderate to high proportion of sites and habitat are in reserve land allocations; or limited number of sites within reserves, but proportion or amount of potential habitat within reserves is high, and there is high probability that the habitat is occupied.
- Sites are relatively well distributed or only partially restricted within the species range
- Matrix Standards and Guidelines or other elements of the Northwest Forest Plan provide for reasonable assurance of species persistence.

Species removed from the Survey and Manage Standards and Guidelines because they are not closely associated with late-successional or old-growth forests, but are still of concern for persistence, will be considered for inclusion in the Agencies' special status species programs.

Criteria for Changing a Species from One Category to Another in Survey and Manage

New information to support changing a species from one Survey and Manage category to another must address the specific criteria for the categories involved in the change. The new information must support the proposed change by showing how the species better meets the criteria for the proposed category.

The criteria for assigning a species to a different category are included under the Description of Categories section.

Analysis Process for New Information

The process for analyzing or evaluating new information pertaining to species will involve a panel of agency taxonomic experts, resource specialists, and managers (see the 2001 ROD, Attachment 1, Exhibit B). The panel of experts will convene at least once a year to evaluate and respond to new accumulated information and to propose changes to appropriate management of species under the Survey and Manage Standards and Guidelines to the RIEC.

The panel will use the specific criteria and factors defined for making determinations regarding whether there is a concern for persistence and placement of species within individual categories of Survey and Manage. Because Survey and Manage includes species about which little is known, the number and combination of criteria and factors used in making a judgment about concern for persistence or appropriate placement of each species within individual categories will vary, depending on the species and the type and quality of information available. The application of the criteria in the analysis process necessarily relies on the professional judgments of the panel of experts.

For purposes of these evaluations, the factors and criteria listed in these standards and guidelines and applied to each species will constitute the foundation of the assumptions, criteria, factors, and logic to support the conclusions. Application of the information to the criteria will be documented in writing for the record. The recommendations from the panel will be disseminated to lead and cooperating agency taxa experts in draft form for at least 30 days to identify errors, conflicting information, or other evidence that should be included with the information presented by the panel to the RIEC. Details of the annual species review process will be available as administrative record for actions applying resultant changes in the future.

Implementing Changes or Refinements to Survey and Manage

Making Changes to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide

Changes proposed to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide as a result of new information pertaining to species, or new information resulting from application experience, will be made using the same process used to develop the original recommendations and protocols. Changes to Management Recommendations, Survey Protocols, and the Strategic Survey Implementation Guide constitute administrative changes to the technical details of specific site management and surveys, and it is not anticipated such changes will require any further NEPA documentation.

Adding, Removing, and Changing Species Between Categories

The criteria and evaluation process for species that is described in these standards and guidelines for use in future adaptive management changes, is designed to continue approximately the same level of assurance of persistence as intended by the Northwest Forest Plan Standards and Guidelines. The process and results should be relatively consistent over time because the assumptions, criteria, and logic used in reaching determinations relating to species disposition

under the Survey and Manage Standards and Guidelines will remain constant. Proposed changes to assignments of species to categories and proposals to remove species from Survey and Manage, resulting from the periodic evaluations of new information, will be forwarded to the RIEC for review to ensure that current information about the species has been appropriately considered and weighed against the stated criteria. Adaptive management changes to assignments of species will be jointly adopted by the BLM and Forest Service and included in the annual report, along with a summary of the information supporting the changes. Since the effects to species are expected to be consistent with the effects anticipated and described in the upcoming Final SEIS, it is not anticipated such changes will require regular, annual NEPA documentation. The parameters for making adaptive changes are part of the standards and guidelines, and as long as the changes are within these parameters, they would not constitute a change in these standards and guidelines or constitute new information on effects not already anticipated and addressed. Prior to the annual application of results, the Agencies will examine whether the magnitude and nature of changes indicate a need for additional environmental analysis (e.g., an environmental assessment). The results of this examination will be documented and summarized in the annual status report. It is not anticipated that changes made pursuant to the annual species review process will require regular, annual NEPA documentation for three major reasons. First, the parameters for making such changes are clearly delineated and part of these standards and guidelines. Second, adjustments made pursuant to the annual species review process are fully expected to occur and are included in the set of assumptions on which the effects analyses have been made. Third, the status of species relative to the standards and guidelines should remain consistent with, and at least as secure as, that reflected in the Final SEIS, given that the criteria guiding the annual process have been designed in large measure to achieve such consistency. The Agencies will evaluate such changes over time to ensure their application is having the intended result and their accumulated effects are within the scope anticipated by this SEIS. At some point in the future, if such effects rise to the level exceeding that scope, supplemental NEPA analyses can be expected to be conducted at appropriate intervals as necessary or advisable.

The Agencies will involve the public and keep resultant changes and their application visible to the public so potential concerns about application of the above criteria to any particular species or area may be surfaced. First, the Agencies will utilize a data call, open conference, or other method of soliciting appropriate new information about Survey and Manage species. Second, the annual report will be sent to individuals or groups who request it. Individuals and groups that would like to receive the annual report should write to the Interagency Survey and Manage Program Manager, c/o Regional Ecosystem Office, P.O. Box 3623, Portland, OR 97208-3623. Public comments about species changes or anything else in the annual report are invited at any time, and should also be addressed to the program manager. Third, future agency NEPA documents for habitat-disturbing activities will identify if any of these expected future changes in categories will be applied to the planned activity, or will reference a specific years assignments, as documented in the annual status report, that appropriately applies to that activity or project. Specific public concerns about the application of a particular species assignment may be directed toward the activity applying the new assignment.

V. Management Recommendations

Management Recommendations are documents that address how to manage known sites and provide guidance to agency efforts in conserving Survey and Manage species. They are written for the species range or, in rare cases, may apply to provinces within the range. They are the responsibility of management working closely with taxa experts; they are developed by taxa experts and land managers (at any administrative level) for use at field offices of the BLM and Forest Service. Because these documents describe site management, they are subject to review by the REO. This review is to ensure they identify and integrate the habitat or life-history factors key to managing the species to the level of protection intended in the standards and guidelines.

Management Recommendations describe the habitat parameters (environmental conditions) that will provide for a reasonable likelihood of persistence of the taxon at that site. These parameters

serve as the basis for site-specific decisions about what management activities are appropriate within the site. The size of the area to be managed depends on the habitat and requirements for the species. Management may range from maintaining one or more habitat components (such as down logs or canopy cover) to complete exclusion from disturbance for many acres, and may allow loss of some individuals, areas, or elements not affecting continued site occupancy. In high-fire frequency areas such as east of the Cascades or in the Klamath Provinces, specific consideration should be given to the acceptability of the use of prescribed fire in known sites to reduce the risk of future large-scale or high-intensity fire, even if it entails some risk to individual site occupancy.

Management Recommendations may also identify areas where it is no longer necessary to continue surveys prior to habitat-disturbing activities or strategic surveys for the taxon. The Management Recommendation may also provide information on natural history, current species status, species distribution, management goals and objectives, specific management actions or recommendations, monitoring needs, and needs for information and research to the extent such information supports management of known sites and identification of survey priorities. Finally, where information about a species indicates the combination of manage known sites, pre-disturbance surveys, and strategic surveys (and other standards and guidelines of the Northwest Forest Plan) does not provide a reasonable assurance of persistence or does not provide the most efficient way of meeting the persistence objective, Management Recommendations may include additional or in-lieu direction, subject to appropriate NEPA analysis. Such direction may rely on habitat models and other valid scientific analyses that indicate a high probability of occupancy by the species.

Management Recommendations written prior to the Record of Decision for this SEIS may continue to be used until superseded by later versions. Existing Management Recommendations will be revised as new information indicates a need. Revised versions may be applied immediately but will normally be applied to NEPA decisions or decision documents signed 90 or more days after release of the Management Recommendation. In some cases they may include a specific effective date or other language indicating when they are to be applied, depending on when they are issued, what differences there are from the previous version, and the importance of those differences.

Note for Species for Which Grazing is Identified as a Concern: The 1994 Northwest Forest Plan ROD identified a concern for grazing impacts to some of the species now included in Survey and Manage. For these species, the 1994 Northwest Forest Plan language of "known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted" is to be included in Management Recommendations for these species. For the three species for which the Northwest Forest Plan indicated grazing was the ONLY concern (identified on Table 1-1), this phrase is the complete Management Recommendation and no other recommendations are imposed at this time.

Note for Former Protection Buffer Species Included in Survey and Manage but Without Approved Management Recommendations: Management of known sites will follow the Northwest Forest Plan Protection Buffer direction (see Section XI of the 2001 standards and guidelines), latest information (including that displayed in the November 2000 Survey and Manage Final SEIS), and best professional judgment until a Management Recommendation is approved. This affects great gray owl, the fungus *Sarcasoma mexicana*, and Siskiyou Mountains, Larch Mountain, and Shasta salamanders.

VI. Surveys

Surveys Prior to Habitat-Disturbing Activities (Pre-Disturbance Surveys)

Category A requires that site-specific, pre-disturbance surveys be conducted prior to signing NEPA decisions or decision documents for habitat-disturbing activities. These surveys focus on the project unit with the objective of reducing the inadvertent loss of undiscovered sites by searching specified potential habitats prior to making decisions about habitat-disturbing activities. They are done according to the survey protocol for each species and can use methods such as transects or plots that focus on priority habitats, habitat features, or involve the entire project area. These surveys are often referred to simply as pre-disturbance surveys. There are two types of pre-disturbance surveys. Pre-disturbance surveys are practical for species whose physiological characteristics make them likely to be located with reasonable effort. The second type, equivalent-effort surveys, are prescribed as mitigation for some mollusk species whose characteristics, such as extremely small size or irregular cycles when identifying characteristics are visible, make identification during pre-disturbance surveys less likely. The differences between these two types of pre-disturbance surveys, as well as the definition of habitat-disturbing activities, timing requirements for surveys, and the requirements for survey protocols are described in more detail below.

Pre-disturbance and equivalent-effort surveys are not required for younger stands which have not yet become late-successional or old-growth forest. The following definition will be used in making the determination whether a forest stand is late-successional.

> **Late-successional forests** - Forest stands consisting of trees, structural attributes, supporting biological communities, and processes associated with old-growth and/or mature forests (USDA, USDI 1994a). Forest seral stages that include mature and old-growth age classes (USDA, USDI 1994a). Age is not necessarily a defining characteristic but has been used as a proxy or indicator in some usages. Minimum ages are typically 80 to 130 years, more or less, depending on the site quality, species, rate of stand development, and other factors.

Habitat-Disturbing Activities

Habitat-disturbing activities are defined as those disturbances likely to have a significant negative impact on the species' habitat, its life cycle, microclimate, or life support requirements. The evaluation of the scale, scope, and intensity of the anticipated negative impact of the project on habitat or life requirements should include an assessment of the type, timing, and intensity of the disturbing activity. Habitat-disturbing is not the same as ground-disturbing. For example, helicopter logging or logging over snow-pack may not disturb the ground, but might clearly affect microclimate or life cycle habitat factors. Conversely, an activity having soil-disturbing effects might not have a large enough scope to trigger a need to survey (i.e. installation of a sign post within a campground). Routine maintenance of improvements and existing structures is not considered a habitat-disturbing activity. Examples of routine maintenance include pulling ditches, clearing encroaching vegetation, managing existing seed orchards, and falling hazard trees.

The line officer should seek specialists' recommendations to help determine the need for a survey based on site-specific information. In making such determination, the line officer should consider the probability of the species being present on the project site, as well as the probability the project would cause a significant negative effect on the species habitat or the persistence of the species at the site.

Pre-disturbance surveys are not required in the unusual circumstance that a delay in implementation of the activity (to permit pre-disturbance surveys) would result in greatly

increased and unacceptable environmental risk. Such circumstances are subject to approval by the line officer at the next level above the official responsible for the proposal.

Pre-disturbance surveys are not required for wildland fires for resource benefits in designated Wilderness. Wildland fires for resource benefits are prescribed fires that result from natural ignition, are consistent with the applicable land and resource management plan, are addressed in a fire management plan, and are burning within prescription. Even though prescriptions are written well in advance of the burn, pre-disturbance surveys are not required because they would be impractical given the large area covered by prescriptions and the irregular nature of natural ignitions, and because potential impacts to Survey and Manage species are limited because the objective of such fires is limited to mimicking natural processes and succession (1964 Wilderness Act, Section 2(a)) (FSM 2323.32).

Exceptions to the pre-disturbance survey requirement are allowed, with approval by the line officer at the next level above the official responsible for the proposal, for other wildland fires for resource benefits in backcountry, Wilderness Study Areas, roaded natural, and similar areas where the objective of such fires is similar to those in Wilderness.

Exceptions to the pre-disturbance survey requirement may also be proposed for wildland fire for resource benefits in Late-Successional Reserves if the Late-Successional Reserve Assessment addresses the potential presence and likely effect on Survey and Manage species. This aspect of the assessment must conclude that such fire(s) will not prevent achievement of the species persistence objectives of these standards and guidelines. Such exceptions will be approved by the line officer at the next level above the official responsible for the proposal.

Pre-Disturbance Survey Protocols

Survey Protocols for pre-disturbance surveys include instructions for locating the species. The instructions include such information as: (1) likely habitat where the species is of concern; (2) geographical area and substrate where the species is typically located; (3) timing of surveys to best locate the species; (4) appropriate search and sampling techniques; and, (5) detailed guidance for identifying the species. Supplemental information may include field identification guides and techniques for simple laboratory examination.

Pre-disturbance survey protocols should also identify habitat conditions or locations, or criteria for identifying such conditions locally, where surveys are not needed for a reasonable assurance of persistence. Such habitat may include, but not be limited to, seral stages, stand age, stand complexity, or stand origin, where occupied sites, if present, are likely incidental, non-viable, or otherwise not important for meeting overall species persistence objectives.

Existing Survey Protocols will be revised as new information indicates a need. Revised versions of protocols will normally apply to the next projects on which surveys are to be initiated. In some cases, they may include a specific effective date or other language indicating when they are to be applied, depending on when they are issued, what differences there are from the previous version, and the importance of those differences.

New pre-disturbance survey protocols will be prepared for species newly assigned to a category requiring surveys prior to habitat-disturbing activities, whether the category assignment is through these standards and guidelines, or a future assignment through the adaptive management process. The protocols will be prepared by the end of the fiscal year following the fiscal year the species was assigned. The decision date for activities to which these protocols apply will depend on the number of years a survey is required. If a protocol requires 1 year of surveys, activities may proceed for 1 additional fiscal year before pre-disturbance surveys are required, to allow time to conduct the required surveys. If a protocol requires 2 years of surveys, activities may proceed for 2 additional fiscal years before pre-disturbance surveys are required. For example, if a species is added to Category A on January 1, 2004, the protocol will be prepared no later than September 30, 2005, and (assuming a 1-year protocol) the protocol will apply to activities for which NEPA

decisions or decision documents are signed after September 30, 2006. Preparation of a protocol earlier than the due date does not necessarily change the required effective date; the Agencies may need the additional lead time for training, surveys, and related project planning. Actual effective dates will be set in the Survey Protocol documents or the Agencies' transmittal memos, but they will not be later than the above-described date.

Strategic surveys or other information may, in the future, expand the known range of a species requiring pre-disturbance surveys into areas not previously identified in Survey Protocols or ISMS-related species range maps. Confirmation of such expansions will occur with RIEC approval of the results of the annual species review process. Since protocols in these cases are already prepared, the survey requirement applies to activities whose NEPA decision or decision document is signed in the calendar quarter following the first full survey season (as defined in the protocol) after the expanded range is confirmed.

Timing Requirements for Pre-disturbance Surveys

The intent of "surveys prior to habitat-disturbing activities" is to gather relevant information during the NEPA process so that it is available for the decision-maker before actions are taken. Ideally, this information would be available to the Interdisciplinary Teams during preparation of an EA or Draft EIS so it could be used in project analysis, formulation of alternatives, and evaluation of effects. Required surveys should be completed and the results included in an EA or Draft EIS whenever practicable. This would have the added advantage that results would be available during the public review and comment process.

Project schedules could be severely disrupted if the requirement for additional pre-disturbance surveys were imposed after the decision is made and final design, field layout, or contract preparation has begun. Therefore, the date of the decision is the cut-off date for the requirement to conduct "surveys prior to habitat-disturbing activities." In other words, once the decision is made no additional survey requirements are imposed; no NEPA analysis will have to be re-done and no decisions will have to be re-made because of additional survey requirements.

The date of the decision is the signing of the NEPA decision or decision document. Grace periods for newly added species or increases in known range are described under pre-disturbance survey protocols.

Application of Manage Known Sites Direction: Even though pre-disturbance surveys are completed prior to the NEPA decision or decision document, manage known site direction will typically be applied to additional sites of rare species incidentally discovered during other field work after the decision date but prior to sale dates (or for non-contract activities, actual on-the-ground application of work).

Practical Pre-disturbance Surveys

Identification of species for which surveys are practical is basic to helping define the categories of Survey and Manage. If pre-disturbance surveys are practical, the risk of inadvertent loss of undiscovered sites and the likelihood that management activities will be detrimental to meeting species persistence objectives can both be substantially reduced. Conducting practical pre-disturbance surveys also reduces the urgency to locate sites through the use of strategic surveys, at least when compared to species for which pre-disturbance surveys are not practical.

The criteria defines when pre-disturbance surveys are practical or not practical. In general terms, the criteria are designed so that surveys will be practical if a reasonable effort would be likely to determine the presence of a species on a specific area, although the criteria themselves should be used in making the determination, no quantitative standard is implied. Put another way, practicality of surveys generally relates to the ability to confidently answer questions about species presence through surveys, while avoiding unreasonable costs or spending unreasonable amounts of time. The definition of practical is intended to be comparable to that described in the Northwest

Forest Plan Record of Decision as being not difficult (see Appendix J2 of the Northwest Forest Plan Final SEIS, and pp. C-5 and C-6 in the Northwest Forest Plan Record of Decision). However, it is not anticipated that these surveys will find every site.

Surveys prior to initiation of habitat disturbance are considered practical if all of the following criteria apply. Surveys prior to habitat-disturbing activities are considered not practical if any of these factors do not apply.

- The taxon appears annually or predictably, producing identifying structures that are visible for a predictable and reasonably long time.
- The taxon is not so minuscule or cryptic as to be barely visible.
- The taxon can be authoritatively identified by more than a few experts, or the number of available experts is not so limited that it would be impossible to accomplish all surveys or identifications for all proposed habitat-disturbing activities in the Northwest Forest Plan area needing identification within the normal planning period for the activity.
- The taxon can be readily distinguished in the field and needs no more than simple laboratory or office examination to confirm its identification.
- Surveys do not require unacceptable safety or species risks.
- Surveys can be completed in two field seasons (approximately 7-18 months).
- Credible survey methods for the taxon are known or can be developed within a reasonable time period (approximately 1 year).

Equivalent-Effort Surveys

Equivalent-effort surveys are an option for Category B species in old-growth, if strategic surveys are not completed within 5 years (see strategic survey direction under Category B). Equivalent-effort surveys can also be prescribed as mitigation. Equivalent-effort surveys were prescribed as a mitigation measure in the 2001 Record of Decision for five mollusk species whose characteristics, such as small size and identifying characteristics, prevent them from being consistently located during site-specific surveys. Equivalent-effort surveys are pre-disturbance surveys conducted similarly to practical surveys (to the same intensity and effort-usually one field season and no more than two), according to written Survey Protocols, and during the times when the likelihood of detecting the species is highest. Because species characteristics make detection less likely, equivalent-effort surveys are only designed to locate the species if it occurs in an identifiable condition during a reasonable survey time period (no more than two field seasons). The survey is an "equivalent effort" to practical surveys, with protocol adjusted to deal with one or more of the factors described above that make determining presence of the species unlikely.

There are only two differences between equivalent-effort surveys and practical surveys. One difference is that equivalent-effort surveys may need to accommodate one or more of the practicality factors listed above. The other difference is that equivalent-effort surveys are not expected to meet the description of "likely to determine the presence" of a species because the characteristics of these species make finding sites less certain.

Strategic Surveys

Introduction

Strategic surveys are used to gather information at the landscape, population, or site-specific scale to address questions that relate to identified objectives for each category and address the need to manage for a reasonable assurance of species persistence. Information provided by strategic surveys (as well as research and other information-gathering efforts) will help address fundamental questions of Survey and Manage species, including: (1) is there a concern for persistence? (2) is the species rare? (3) is the species closely associated with late-successional forests? (4) what is the appropriate management for the species? and, (5) do the reserve land allocations and other standards and guidelines of the Northwest Forest Plan provide a reasonable

assurance of species persistence? Strategic surveys can also help refine habitat descriptions, define geographic range and information needs for future surveys, and provide important information on population status, life history, and habitat use. All of these questions are to be set in the context of the objectives of the Northwest Forest Plan. Strategic surveys are prescribed for all categories.

Information from strategic surveys feeds into the adaptive management process in these standards and guidelines, provides information for the development of Management Recommendations and pre-disturbance Survey Protocols, and provides information to better focus subsequent strategic surveys if needed. Strategic surveys provide information required in order to change species categories or remove them from Survey and Manage. These surveys also provide information to help establish or confirm direction for managing known sites and conducting pre-disturbance surveys. Finally, for species with few sites, strategic surveys may be the primary method for finding additional sites. Strategic surveys are different from pre-disturbance surveys because they are focused on gathering information about the species and its habitat needs range-wide, and are not focused on determining presence or absence in specific areas prior to habitat-disturbing activities.

There are various scales of strategic surveys. The appropriate scales to be used, and the type of information to be gathered, are determined by the needs of each species and the needs or objectives suggested by the category to which they are assigned. However, strategic surveys are envisioned as samples with sampling intensity dependent upon information needs and the characteristics of the species and the habitat. The information to determine range, habitat associations, distribution, ability to survey for, and meet other strategic survey objectives is expected to come from a series of samples distributed on the landscape. Once surveys have reasonably established those parameters, or further surveys are not expected to contribute significant additional information toward those objectives, strategic surveys may be considered completed. For some very rare species, this means strategic surveys may be complete even if few or no additional sites are found. The long-term benefit to Survey and Manage species comes from continuing to apply other Survey and Manage Standards and Guidelines over time, not continuing to do strategic surveys indefinitely.

Identifying Information Needs and Priorities

The first step toward identifying strategic survey needs is the identification of the persistence and management questions for each species. Three primary questions guide this process:

1. What are the primary concerns for species persistence?
2. How do we manage species and habitats to ensure species persistence?
3. Does the species need the Survey and Manage Standards and Guidelines to provide a reasonable assurance of persistence?

For planning purposes, information needs can be: (1) divided into species range and habitat associations; (2) to improve and direct species and habitat management; or, (3) directly relevant for dealing with specific persistence concerns. Information needs are compared with existing information (e.g., in ISMS and published literature) to determine current state of knowledge and to identify information gaps. These information gaps are considered in the context of existing management direction (e.g., what is the level of concern for persistence under other elements of the Northwest Forest Plan and within the present Survey and Manage category), to set the biological priorities for strategic surveys. Priorities are also determined by how the information may be used to increase management efficiency. If answers to these questions may lead to species changing categories or being removed from Survey and Manage, there is a benefit in reduced activity costs and reduced impacts to other forest management activities. Both the biological priorities and the management efficiency benefits must be described or quantified for display in the Strategic Survey Implementation Guide (see below) for use by management for setting survey priorities.

Strategic Survey Methods and Scales

Strategic Surveys may be accomplished through various methods, such as acquiring information from field surveys, herbaria, museums, literature, field units and other sources, and using various analytical tools such as building and validating habitat models. These methods are explored, developed, and analyzed for effectiveness and efficiency for acquiring the needed information. The selection of one or more of these methods depends, at least in part, on the scale that will best address the information need. The different approaches to strategic surveys will consider the contributions of various scales of surveys generally characterized as:

Broad-scale surveys designed to:

- Include multiple species.
- Provide information on species occurrence, distribution, range, and habitat associations.
- Address different Survey and Manage questions by stratifying the survey area into significant ecological or geographical units such as forest age class (e.g., young stand vs. old-growth) or land allocations (e.g., Late-Successional Reserves vs. Matrix).
- Refine habitat characterization.

Mid- to fine-scale surveys designed to:

- Refine habitat characterization.
- Provide information on how to manage species or their habitat, particularly at known sites.

Detailed studies (linked to research as appropriate) and other surveys designed to:

- Address specific questions and information needs (e.g., determining whether a species is still extant at a specific location, or conducting studies to examine specific disturbance effects on persistence of individuals at a site).

Species or surveys may be grouped for cost efficiency. Preliminary identification of available resources, including the administrative levels that will participate, is also a consideration.

Strategic Survey Implementation Guide

A Strategic Survey Implementation Guide displaying the known strategic survey needs for all species or species groups will be developed at the range-wide or regional scale, and generally be updated annually to reflect changes in information and priorities resulting from the previous year's accomplishments or new information. The Strategic Survey Implementation Guide is, of necessity, dynamic, particularly during the first years while information needs are clarified. Additionally, changes to categories or other new information will lead to new questions. The plan, with annual updates, will help ensure deadlines listed in these standards and guidelines are met and identify the magnitude and likely duration of the strategic survey program (at least for currently known information needs) for planning and scheduling purposes. The document will help focus annual work planning on the priority information needs, provide information for long-range planning, and facilitate the grouping of surveys for efficiency. The Strategic Survey Implementation Guide is subject to review by the RIEC to ensure identified information needs and priorities will further the objectives of the Northwest Forest Plan.

The implementation iuide will include, by species or taxa group:

- A summary of the information needs proposed to be answered by the strategic survey.
- The benefits expected by answering each identified need, either in terms of increased assurance of species persistence or reduced costs or impacts.
- Identification of methods (and scale) that would best meet the information needs.
- Relative priorities or priority-setting criteria. Management will set relative priorities or describe priority-setting criteria using the other three elements (and within expected resource availability).

Implementation and Responsibility

Responsibility for the design and coordination of strategic surveys rests with the regional offices of the Forest Service and state offices of the BLM, in collaboration with the U.S. Fish and Wildlife Service and Research Agencies, to ensure consistency, and because strategic surveys are generally intended to address information across a species range within the Northwest Forest Plan area. Coordination with both research agencies and field units regarding new information, assistance for design and conduct of surveys, identification of management needs, and availability of needed resources is important as well. Survey design should build upon or complement previous strategic, extensive, or general regional surveys whether conducted at the regional or local scale. Responsibility for implementation and follow-up actions may be delegated to administrative units or groups of administrative units, particularly where the range of a species is essentially confined to those units or the units are in a better position to assemble appropriate resources. Implementation includes all aspects of the planning and conduct of surveys, research, or other information-gathering activities. This may include hiring of personnel, mobilizing crews, contracting, selecting survey sites, scheduling site visits, developing protocols, etc.

Information from strategic surveys (and other sources) is maintained primarily in the ISMS database and on species distribution maps.

Analysis and Use of Results

Information from strategic surveys is used in the annual species review process (see the Adaptive Management section), is incorporated into Management Recommendations and pre-disturbance Survey Protocols, and becomes part of the existing information used in the future identification of information needs and priorities. All three of these uses may lead, directly or indirectly, to the need for additional information. Information from completed surveys, and the identification of new survey needs, will be incorporated into the Strategic Survey Implementation Guide as appropriate.

Specific objectives of strategic surveys vary by category, species, and management need. Strategic surveys for a species are considered to be complete when any one of the following four conditions apply, and the resultant information has been compiled and analyzed, as appropriate, and presented in the appropriate form for use by the target audience. This form may range from inputting the data into ISMS for use during the annual species review process to preparing a summary of the data and related Management Recommendations to assist project planners. The four conditions are:

1. The objectives of the strategic surveys (such as specific information needs) have been accomplished and information is sufficient to conclude that existing or resultant management direction will provide a reasonable assurance of persistence.

2. The objectives of the strategic surveys (such as specific information needs) have been accomplished and further surveys are not likely to contribute additional significant information about distribution, range, habitat associations, how to conduct pre-disturbance surveys, or other strategic survey objectives.

3. Adequate sites or habitats for the species have been located and are appropriately managed to provide reasonable assurance of persistence for the species.

4. For species with very-limited habitat, all known potential habitat of the species has been surveyed, and there is little likelihood that additional undiscovered sites of the species will be located by further surveying.

Strategic survey accomplishments will be summarized in the annual report.

VII. Reports, Monitoring, and Review

Annual Status Reports

An interagency, Northwest Forest Plan area-wide annual status report (the annual report), will be prepared to display progress and identify products resulting from implementation of these standards and guidelines. The report will include, at a minimum, results of adaptive management changes, status of Management Recommendations and Survey Protocols, a summary of the Strategic Survey Implementation Guide (including the status of strategic surveys), status and results of ongoing monitoring, and important new management direction. This report is the primary tool for the public to find out about annual changes to species assignments and resultant application of surveys to agency activities. The Agencies will establish a mailing list for all persons wishing to receive all or a part of this report. Until and unless the Agencies identify and publish an alternative source, such requests should be addressed to the Interagency Survey and Manage Program Manager, c/o Regional Ecosystem Office, P.O. Box 3623, Portland, OR 97208-3623.

Monitoring

The primary objective of monitoring relative to Survey and Manage species is to evaluate progress toward meeting species persistence objectives. Monitoring for the Survey and Manage Standards and Guidelines will follow the monitoring direction included in the Northwest Forest Plan and will be further defined and adapted to the categories described in these standards and guidelines. Sources of new information that will contribute to monitoring, and help identify the specific monitoring questions, include pre-disturbance and strategic surveys, as well as publications, research results, public, academia, and other sources.

The Northwest Forest Plan Record of Decision monitoring section (pp. E-4 through E-10) identifies three types of monitoring: implementation, effectiveness, and validation.

1. Implementation monitoring for the Northwest Forest Plan began in 1996 and has been conducted annually. Future Northwest Forest Plan implementation monitoring protocols will be revised as needed.

2. Effectiveness monitoring for Survey and Manage is expected to be most appropriately addressed as part of the Biological Diversity effectiveness monitoring (Northwest Forest Plan Record of Decision, p. E-8) and will focus on multiple species and habitat relationships. Also some of the special monitoring issues and situations discussed on pages E-10 and 11 are particularly relevant.

3. Validation monitoring questions described in the Northwest Forest Plan that relate to Survey and Manage substantially overlap with questions that strategic surveys are designed to address. Strategic surveys and the annual analysis that is part of the annual species review process are generally expected to contribute substantially to meeting validation monitoring objectives.

Review by the Regional Ecosystem Office

Three documents are referenced in these standards and guidelines: Management Recommendations, Survey Protocols, and Strategic Survey Implementation Guide. Each document plays an important role in accomplishing Survey and Manage objectives. They are typically written for the species range. The documents are the responsibility of management working closely with taxa experts; they are developed by taxa experts and land managers (at any administrative level) for use at field offices. New or revised versions of these documents are subject to review by the REO to ensure they identify and integrate the habitat or life-history

factors key to managing the species to the level of protection intended in the standards and guidelines. Changes resulting from the annual species review are also subject to REO (or RIEC) review as described in these standards and guidelines. The REO or RIEC may develop criteria to exempt certain documents or processes from review.

"Subject to review by the Regional Ecosystem Office" means review is required unless the REO has specifically provided an exemption. As described in the Northwest Forest Plan Standards and Guidelines (p. E-16), the REO provides staff work and support to facilitate RIEC decisions. Although the standards and guidelines refer to REO review, it is understood that the REO recommends to the RIEC who has responsibility for the decisions. The RIEC may delegate responsibility to complete these reviews.

VIII. Additional Mitigation Measures

This section is reserved and will be determined when a Record of Decision is issued. Additional mitigation measures included in the 2001 Record of Decision have been incorporated into these standards and guidelines.

IX, X, XI. Omitted

XII. Former Protection Buffer Species Without Management Recommendations

For former Protection Buffer species included in Survey and Manage but without approved Management Recommendations, management of known sites will follow the former Northwest Forest Plan Protection Buffer direction (except no LSRs or MLSAs are created), latest information (including that displayed in the 2000 Survey and Manage Final SEIS), and best professional judgment until a Management Recommendation is approved. Listed below is the former Protection Buffer direction for the four affected species: great gray owl and Siskiyou Mountains, Larch Mountain, and Shasta salamanders. This direction will be replaced when Management Recommendations are prepared according to these standards and guidelines.

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. However, it is also 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 and establish 1/4-mile protection zones around known nest sites. Within 1 year of the signing of the [1994 NWFP] 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.

Siskiyou Mountains Salamander: This species occurs within an extremely narrow range on the Rogue River, Siskiyou, and Klamath National Forests. Its range does not fall within any of the Habitat Conservation Areas identified by the Interagency Scientific Committee in Oregon. Additional surveys conducted using a standardized protocol must be undertaken to delineate range and identify subpopulations. All populations must be protected by delineating an occupied site and avoiding disturbance of talus throughout the site, especially on moist, north-facing slopes, particularly in Oregon where Habitat Conservation Areas do not incorporate species' range. Because this species seems to require cool, moist conditions, a buffer of at least the height of

one site-potential tree or 100 feet horizontal distance, whichever is greater, surrounding the site, must be retained around the outer periphery of known sites. Overstory trees must not be removed within the boundary of this buffer. The implementation schedule for this species is the same as for [1994 NWFP] survey and manage components 1 and 2.

Shasta Salamander: This species is very narrowly distributed, occurring only in localized populations on the Shasta-Trinity National Forest. Only a small part of its range is included within Habitat Conservation Areas identified by the Interagency Scientific Committee (1990) (status within Late-Successional Reserves has not been determined). It occurs in association with limestone outcrops, protected by an overstory canopy. All known and future localities must be delineated and protected from timber harvest, mining, quarry activity, and road building within the delineated site, and a buffer of at least the height of one site-potential tree or 100 feet horizontal distance, whichever is greater, should surround the outcrop. Additional surveys conducted using a standardized protocol must be undertaken to identify and delineate all occupied sites within the species' potential range.

Appendix 5

Draft
BIOLOGICAL EVALUATION

Federal Endangered, Threatened, and Proposed Species
Forest Service Sensitive Species

Draft Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines

Lead Agencies: **Forest Service - U.S. Department of Agriculture**
Bureau of Land Management - U.S. Department of the Interior

Introduction

This biological evaluation was prepared to meet Forest Service policy described in Forest Service Manual (FSM) 2672.4. This biological evaluation addresses the three alternatives analyzed in the Draft Supplemental Environmental Impact Statement (SEIS) to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. The current Survey and Manage Standards and Guidelines are contained in the Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2001 Record of Decision), which amended the Northwest Forest Plan (1994 Record of Decision), which amended the land and resource management plans for National Forests and BLM Districts within the range of the northern spotted owl. The underlying need and the purposes for developing this Draft SEIS are described in Chapter 1.

This Biological Evaluation addresses effects on: (1) species listed or proposed for listing under the Endangered Species Act (ESA) as endangered or threatened species; (2) habitat designated or proposed for designation under ESA as critical habitat; and, (3) species listed as sensitive by the Regional Foresters in Forest Service Regions 5 and 6.

The Draft SEIS assesses three alternatives. Alternative 1 is the No-Action Alternative and would retain the Survey and Manage Standards and Guidelines. Under Alternative 2, the Proposed Action, the Agencies propose to amend 28 land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines. Alternative 3 is similar to the proposed action except the Agencies would amend all land and resource management plans by modifying the Survey and Manage Standards and Guidelines as described below.

Description of Alternatives

The following general description of the alternatives summarizes the information contained in Chapter 2 of the SEIS. While this summary is intended to provide sufficient detail for the reader to understand the impacts described later in this document, the reader is referred to Chapter 2 of the SEIS for a complete description of the alternatives being evaluated. Where apparent discrepancies occur between the description of the alternatives as presented here and in Chapter 2, the text of the SEIS takes precedence.

Alternative 1, No-Action

The No-Action Alternative would result in no change in existing management contained in the 2001 Record of Decision. Consequently, there would be no effect to listed or proposed species or designated or proposed critical habitats resulting from a decision to select this alternative. For aquatic sensitive species or sensitive species not associated with late-successional or old-growth forests, the No-Action alternative will have no impact. For other terrestrial sensitive species the No-Action alternative may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Alternative 2

Under Alternative 2, the Agencies propose to amend land and resource management plans within the range of the northern spotted owl to remove the Survey and Manage Standards and Guidelines. Alternative 2 maintains all other elements of the Northwest Forest Plan.

Separate from this proposal, the Agencies reviewed the 304 Survey and Manage species to determine their eligibility for inclusion in the Agencies' existing Special Status Species Programs.

Species removed from Survey and Manage and also eligible for inclusion in the Agencies' Special Status Species Programs are expected to be added to those programs.

Alternative 3

Under Alternative 3, the Agencies would amend land and resource management plans within the range of the northern spotted owl by modifying the Survey and Manage Standards and Guidelines. Modifications would include: (1) removing the uncommon species category and all requirements pertaining to them; (2) eliminating the requirement to conduct pre-disturbance surveys in non-late-successional and non-old-growth forest stands; (3) changing the review requirements for excepting known sites from management; and, (4) changing the review process for excepting pre-disturbance survey requirements for wildland fire for resource benefits.

Like Alternative 2, species removed from Survey and Manage and also eligible for inclusion in the Agencies' Special Status Species Programs are expected to be added to those programs

Determinations

The purpose of this biological evaluation is to make a determination of the likely effects of a decision to continue to implement the No-Action Alternative, or modify existing management through adoption of one of the action alternatives. The determination of effects applies to Forest Service sensitive species and to species listed under ESA as endangered, threatened, or proposed and their designated or proposed critical habitat. This determination of effects results from an analysis of the changes to the species' baselines that are likely to occur as a result of implementing one of these alternatives. Changes to the baseline are measured against the baseline that was assumed to occur prior to the implementation of this action. For this SEIS, the baseline subject to change by the action alternatives is the baseline established at the time of the Northwest Forest Plan and associated SEIS analysis, as modified by subsequent analyses related to the Northwest Forest Plan. The No-Action Alternative would result in no changes to the environmental baseline.

Threatened and Endangered Species

This section discusses the expected effects to species listed as threatened or endangered, or proposed for listing, under the ESA of 1973, as amended.

Northern Spotted Owl (*Strix occidentalis caurina*)

Background and Affected Environment

Management of the northern spotted owl and its habitat on federally managed lands was an important consideration in the design of the Northwest Forest Plan. This species received extensive attention in the Northwest Forest Plan Final SEIS and its supporting documents. The Biological Opinion for the Draft of the Northwest Forest Plan concluded:

> "*…the adoption of Alternative 9, as modified, is not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of any designated critical habitat for those species. The late-successional and riparian reserve features of Alternative 9 are particularly important contributions to the conservation of the spotted owl and marbled murrelet*" (USDA, USDI 1994a, p. 3, Appendix G).

The Survey and Manage mitigation measure was not a component of the Northwest Forest Plan Draft SEIS. The addition of the Survey and Manage mitigation measure would have an insignificant effect on the maintenance of spotted owl populations (USDA, USDI 2000a, p. 398).

This was due to the small scale and isolated nature of the additional late-successional and old-growth forest areas that would be retained due to the Survey and Manage mitigation measure.

The Northwest Forest Plan concluded that the anticipated rate of timber harvest in Matrix and Adaptive Management Areas would occur in a manner that would allow the habitat to regrow and spotted owl populations to stabilize in the Late-Successional Reserves and Congressionally Reserved Areas.

The Survey and Manage Final SEIS 2000 concluded that neither the original basis for the assessment nor the conclusion of the effects to the northern spotted owl as presented in the Northwest Forest Plan would be affected by the Survey and Manage Standards and Guidelines.

Anticipated Impacts from Implementation of the Action Alternatives

Reserve land allocations protect about 80 percent of the federally managed lands within the Northwest Forest Plan area. Eighty-six percent of the remaining late-successional and old-growth forests are in these reserves. The remaining 14 percent is available for regularly scheduled timber harvest. The Northwest Forest Plan projected that less than 2.5 percent of the late-successional forest would be harvested per decade. Actual harvest has been well below that rate (see Timber Harvest section of Chapter 3&4). The reduced rate of harvest is due primarily to greater than expected riparian reserve coverage, the effects of Survey and Manage mitigation measure, and legal challenges. Harvest levels in both action alternatives would be expected to approach the Probable Sale Quantity (PSQ) of 805 million board feet per year, but would not exceed the rate projected in the Northwest Forest Plan Final SEIS or the Biological Opinion for the Northwest Forest Plan (USDA, USDI 1994a, Appendix G). These levels of impacts to northern spotted owl habitat are not expected to exceed those levels consulted upon in 1994.

Removing the Survey and Manage Standards and Guidelines as described in Alternative 2 could release for timber harvest up to 21,000 acres that is currently managed as known sites. The effect of this change is anticipated to have little effect on northern spotted owls and no reduction in the function or use of northern spotted owl designated critical habitat due to the small size and dispersed nature of the known sites is expected. Alternative 3 would release less than 21,000 acres due to the continuation of the Survey and Manage Standards and Guidelines for rare species. Neither of the action alternatives would exceed the scope of impacts originally consulted upon in 1994. Due to the anticipated impacts and rationale described above, Alternatives 2 and 3 may affect but are not likely to adversely affect northern spotted owls and will have no effect on northern spotted owl designated critical habitat.

Marbled Murrelet (*Brachyramphus marmorata)*

Background and Affected Environment

Management of the marbled murrelet and its habitat on federally managed lands was an important consideration in the design of the Northwest Forest Plan. This species received extensive attention in the Northwest Forest Plan Final SEIS and its supporting documents. The Biological Opinion for the Draft of the Northwest Forest Plan concluded:

> "*…the adoption of Alternative 9, as modified, is not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of any designated critical habitat for those species. The late-successional and riparian reserve features of Alternative 9 are particularly important contributions to the conservation of the spotted owl and marbled murrelet*" (USDA, USDI 1994a, p. 3, Appendix G).

The management strategy for marbled murrelets in the Northwest Forest Plan includes two primary components: (1) protection and development of marbled murrelet nesting habitat inside

the large reserves near the coast; and, (2) retention of all current and future known marbled murrelet nest sites in all land allocations and protecting occupied habitat.

Anticipated Impacts from Implementation of the Action Alternatives

Under Alternatives 2 and 3, small areas of late-successional forest that are currently managed as known sites of Survey and Manage species would be released for timber harvest. The known sites of Survey and Manage species being managed are generally only a few acres in size and are not known to be occupied by marbled murrelets. The Northwest Forest Plan projected that less than 2.5 percent of the late-successional forest would be harvested per decade. Actual harvest has been well below that rate (see Timber Harvest section of Chapter 3&4). The reduced rate of harvest is due primarily to greater than expected riparian reserve coverage, the effects of the Survey and Manage mitigation measure, and legal challenges. Harvest levels in both action alternatives would be expected to approach the PSQ of 805 million board feet per year, but would not exceed the rate projected in the Northwest Forest Plan Final SEIS or the Biological Opinion for the Northwest Forest Plan (USDA, USDI 1994a, Appendix G). These levels of impacts to marbled murrelet habitat are not expected to exceed those levels consulted upon in 1994.

Removing the Survey and Manage Standards and Guidelines as described in Alternative 2 could release for timber harvest up to 21,000 acres that are currently managed as known sites. The effect of this change is anticipated to have little effect on marbled murrelet and no reduction in the function or use of marbled murrelet designated critical habitat due to the small size and dispersed nature of the known sites. Alternative 3 would release less than 21,000 acres due to the continuation of the Survey and Manage Standards and Guidelines for rare species. Neither of the action alternatives would exceed the scope of impacts originally consulted upon in 1994. Due to the anticipated impacts and rationale described above, Alternatives 2 and 3 may affect but are not likely to adversely affect marbled murrelets and will have no effect on marbled murrelet designated critical habitat.

Bald Eagle (*Halieatus leucocephalus*)

Background and Affected Environment

The Agencies survey extensively for bald eagles and obtain valuable sighting information from the general public due to the high visibility of bald eagles. Management of the bald eagle includes preparation of site-specific management plans and providing protection zones and management areas, as needed, to protect the species and its habitat.

Anticipated Impacts from Implementation of the Action Alternatives

The requirements to conduct specific surveys and develop site management plans for bald eagles do not change between the alternatives. Consultation on the Northwest Forest Plan concluded *"… that the adoption of Alternative 9, as modified, is not likely to jeopardize the continued existence of any listed species"* (USDA, USDI 1994a, Appendix G).

Under Alternatives 2 and 3, small areas of late-successional forest that are currently managed as known sites of Survey and Manage species would be released for timber harvest. The known sites of Survey and Manage species are generally only a few acres in size and are not known to be occupied by bald eagles. The Northwest Forest Plan projected that less than 2.5 percent of the late-successional forest would be harvested per decade. Actual harvest has been well below that rate (see Timber Harvest section of Chapter 3&4). The reduced rate of harvest is due primarily to greater than expected riparian reserve coverage, the effects of the Survey and Manage mitigation measure, and legal challenges. Harvest levels in both action alternatives would be expected to approach the PSQ of 805 million board feet per year, but would not exceed the rate projected in the Northwest Forest Plan Final SEIS or the Biological Opinion for the Northwest Forest Plan (USDA, USDI 1994a, Appendix G). These levels of impacts to bald eagle habitat are not expected to exceed those levels consulted upon in 1994.

Removing the Survey and Manage Standards and Guidelines as described in Alternative 2 could release for timber harvest up to 21,000 acres that are currently managed as known sites. The effect of this change is anticipated to have little effect on bald eagle due to the small size and dispersed nature of the known sites. Alternative 3 would release less than 21,000 acres due to the continuation of the Survey and Manage Standards and Guidelines for rare species. Neither of the action alternatives would exceed the scope of impacts originally consulted upon in 1994. Due to the anticipated impacts and rationale described above, Alternatives 2 and 3 may affect but are not likely to adversely affect bald eagles. There is no designated critical habitat for bald eagle.

California red-legged frog (*Rana aurora draytonii*)

Background and Affected Environment

The most important habitat for California red-legged frog is aquatic and riparian. This species is known to sometimes move through moist forest habitat during dispersal. Within the Northwest Forest Plan area, the listed range of the species may include some portions of the Mendocino and Shasta-Trinity National Forests. This area has poor quality potential habitat (lack of narrow, incised channels and pools, dry chaparral/knobcone pine habitat, etc.). Few historical sightings for this species have been recorded in its limited potential range in the Northwest Forest Plan area.

Anticipated Impacts from Implementation of the Action Alternatives

The changes in the Survey and Manage Standards and Guidelines under Alternatives 2 and 3 would not affect the riparian-associated habitat of the California red-legged frog. The elevation bands that the species is most likely to occur in do not overlap with the areas most likely to be managed in either action alternative; therefore, the action alternatives are expected to have little or no effect on the species (Bratch 2000, pers. comm.).

Under all alternatives, the Agencies would survey for listed species in the vicinity of proposed projects. These surveys are designed to have a high likelihood of locating populations of California red-legged frogs irrespective of whether surveys are also done for Survey and Manage species. In addition, the species habitat will be provided a high level of protection through implementation of Aquatic Conservation Strategy objectives and the reserve land allocations. Therefore, there would be no impacts to this species anticipated from either action alternative. Implementation of either action alternative will have no effect on the California red-legged frog.

Canada Lynx (*Lynx canadensis*)

Background and Affected Environment

The Canada lynx was listed by the U.S. Fish and Wildlife Service as a threatened species within the conterminous United States, effective April 24, 2000. Concurrent with the listing process, a national interagency Lynx Conservation Assessment and Strategy was developed to provide a consistent and effective approach to conservation of Canada lynx on federally managed land in the conterminous United States. On February 7, 2000, the Forest Service and the U.S. Fish and Wildlife Service entered into a conservation agreement. The Forest Service agreed to consider conservation measures in the Lynx Conservation Assessment and Strategy when designing and implementing activities that might affect lynx.

Anticipated Impacts from Implementation of the Action Alternatives

The Survey and Manage mitigation measure plays no role in the protection of the Canada lynx; therefore, there are no anticipated impacts from implementation of either action alternative on Canada lynx. The Forest Service has agreed not to conduct activities that are likely to adversely affect the lynx, unless land and resource management plans undergo additional National Environmental Policy Act and ESA review. For these reasons, implementation of either action

alternative will have no effect on Canada lynx.

Gray Wolf (*Canis lupus*)

Background and Affected Environment

The range of the gray wolf includes portions of the Northwest Forest Plan area, including the northern Cascade Range in Washington. Gray wolves are not closely associated with late-successional forest, but use a variety of open and forested habitat that support deer, elk, and other species that are their primary prey, as well as areas supporting small mammal populations.

Anticipated Impacts from Implementation of the Action Alternatives

Both action alternatives would have nearly identical effects on gray wolf habitat. Because gray wolves are not dependent on late-successional forest, the 21,000 acres of the small, isolated patches of late-successional forest that would be managed under the Survey and Manage Standards and Guidelines would have no effect on habitat for this species. None of the alternatives would affect the original basis for the assessment of the effects and conclusions in the Northwest Forest Plan Final SEIS. Because of the above, implementation of either action alternative will have no effect on gray wolf.

Grizzly Bear (*Ursus arctos*)

Background and Affected Environment

The range of the grizzly bear includes portions of the Northwest Forest Plan area, including the National Forests of the Cascade Range in Washington. While grizzly bears are not closely associated with late-successional forests, they use a variety of habitat, including forested areas for hiding and cover.

Anticipated Impacts from Implementation of the Action Alternatives

Both action alternatives would have nearly identical effects on grizzly bear habitat. Because grizzly bears are not dependent on late-successional forest, the 21,000 acres of the small, isolated patches of late-successional forest that would be managed under the Survey and Manage Standards and Guidelines would have no effect on habitat for this species. None of the alternatives would affect the original basis for the assessment of the effects and conclusions in the Northwest Forest Plan Final SEIS. For these reasons, implementation of either action alternative will have no effect on grizzly bear.

Listed or Proposed Plant Species Associated with Late-Successional Forests

The Forest Service surveys for listed and proposed plant species associated with late-successional or old-growth forests in the vicinity of proposed projects. These surveys are designed to have a high likelihood of locating populations of such plants irrespective of whether surveys are also done for Survey and Manage species. Since surveys for listed or proposed plant species will discover and subsequently protect these species with or without the Survey and Manage mitigation measure, there would be no impacts anticipated to these species from either action alternative. Therefore, the implementation of either action alternative will have no effect on any listed plant species associated with late-successional and old-growth forests. The implementation of either action alternative is not likely to jeopardize the continued existence of or adversely modify proposed critical habitat of any proposed plant species that is associated with late-successional and old-growth forests.

Listed or Proposed Species not Associated with Late-Successional Forests

The following listed or proposed terrestrial or inland-aquatic species occur within the Northwest Forest Plan area. These species are not associated with late-successional and old-growth forests. The Survey and Manage Standards and Guidelines were developed to address concerns for species associated with late-successional forest. Most habitat managed under the Survey and Manage Standards and Guidelines is likely to be late-successional conifer forest. Therefore, any changes to the Survey and Manage Standards and Guidelines are not expected to affect these species or the conclusions of the Northwest Forest Plan Final SEIS. Because the following species are not associated with late-successional or old-growth forests, there is no effect from implementation of either action alternative on any of these species.

Vascular Plants

Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*
MacDonald's rockcress	*Arabis macdonaldiana*
Marsh sandwort	*Arenaria paludicola*
Applegate's milkvetch	*Astragalus applegatei*
Clara Hunt's milkvetch	*Astragalus clarianus*
Tiburon paintbrush	*Castilleja affinis* ssp. *neglecta*
Golden Indian paintbrush	*Castilleja levisecta*
Howell's spineflower	*Chorizanthe howellii*
Sonoma spineflower	*Chorizanthe valida*
Baker's larkspur	*Delphinium bakeri*
Yellow larkspur	*Delphinium luteum*
Willamette daisy	*Erigeron decumbens* var. *decumbens*
Menzies' wallflower	*Erysimum menziesii*
Gentner's mission-bells	*Fritillaria gentneri*
Marin dwarf-flax	*Hesperolinon congestum*
Showy stickweed	*Horkelia venusta*
Water howellia	*Howellia aquatilis*
Beach layia	*Layia carnosa*
Burke's goldfields	*Lasthenia burkei*
Contra costa goldfields	*Lasthenia cojugens*
Western lily	*Lilium ocidentale*
Large-flowered wooly meadowfoam	*Limnanthes floccose* spp. *grandiflora*
Bradshaw's lomatium	*Lomatium bradshawii*
Agate desert-parsley	*Lomatium cookii*
Kincaid's lupine	*Lupinus sulphereus* var. *kincaidii*
Pt. Reyes clover lupine	*Lupinus tidestromii* var. *layneae*
Tidestrom's clover lupine	*Lupinus tidestromii* var. *tidestromii*
Many-flowered navarretia	*Navarretia leucocephala* ssp. *plieantha*
Slender orcutt grass	*Orcuttia tenuis*
Yreka phlox	*Phlox hirsuta*
Hairy (rough) popcorn flower	*Plagiobothrys hirtus*
Calistoga allocarya	*Plagiobothrys strictus*
Napa bluegrass	*Poa napensis*
Nelson's checkermallow	*Sidalcea nelsoniana*
Wenatchee Mountain checkermallow	*Sidalcea oregana* var. *calva*
Kenwood Marsh checkermallow	*Sidalcea oregana* var. *valida*
Ladies'-tresses	*Spiranthes diluvialus*
Kneeland Prairie penny-cress	*Thlaspi californicum* (*montanum* var. *californicum*)
Showy Indian clover	*Trifolium amoenum*

Invertebrates

Conservancy fairy shrimp	*Branchinecta conservatio*
Vernal pool fairy shrimp	*Branchinecta lynchi*
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*
Mission blue butterfly	*Icaricia icarioides missionensis*
Fender's blue butterfly	*Icaricia icarioides fenderi*
San Bruno elfin butterfly	*Incisalia mossii bayensis*
Vernal pool tadpole shrimp	*Lepidurus packardi*
Lotis blue butterfly	*Lycaeides argyrognomon lotis*
Shasta (placid) crayfish	*Pacifastacus fortis*
Callippe silverspot butterfly	*Speyeria callippe callippe*
Behren's silverspot butterfly	*Speyeria zerene behrensii*
Oregon silverspot butterfly	*Speyeria zerene hippolyta*
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*
California freshwater shrimp	*Syncaris pacifica*

Fish

Tidewater goby	*Eucyclogobius newberryi*
Delta smelt	*Hypomesus transpacificus*
Oregon chub	*Oregonichthys* (*Hybopsis*) *crameri*

Birds

Western snowy plover (coastal populations)	*Charadrius alexandrinus nivosus*
Brown pelican	*Pelcanus occidentalis*
California clapper rail	*Rallus longirostris obsoletus*

Mammals

Point Arena mountain beaver	*Aplodontia rufa nigra*
Steller's (northern) sea lion	*Eumetopias jubatus*
Columbian white-tailed deer	*Odocoileus virginianus leucurus*
Salt marsh harvest mouse	*Reithrodontomys raviventris*

Listed and Proposed Fish and Designated and Proposed Critical Habitat

All projects proposed on Forest Service administered lands must meet the Aquatic Conservation Strategy objectives of the Northwest Forest Plan. As proposed projects are designed and analyzed for effects to listed fish, needs of the fish species and habitat elements required to meet Aquatic Conservation Strategy objectives will be identified. Alternatives 2 and 3 would not alter this assessment process; therefore, there would be no change in effect as a result of the removal or modification of the Survey and Manage Standards and Guidelines when compared to the No-Action alternative. Critical habitat for listed fish corresponds well with Riparian Reserves in the Northwest Forest Plan and the Aquatic Conservation Strategy objectives. Therefore, any effects on listed or proposed fish will be minimal due to the low acreage, small size, and dispersed nature of managed known sites. Removal of species from Survey and Manage will not change the environmental baseline for listed fish species or result in changes to impacts to these species that were not anticipated in the analysis of the Northwest Forest Plan and subsequent analyses. For the two action alternatives, the determination is no effect for listed and proposed fish, and designated and proposed critical habitat. Refer to Table 3&4-2 for fish species listed (or proposed for listing) in the Northwest Forest Plan area as endangered or threatened under the ESA.

Forest Service Sensitive Species

This section addresses sensitive species currently listed in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (see Table 5-1).

The sensitive species program includes species for which there is a documented concern for viability within one or more administrative units within the species' historic range (FSM 2670.22, WO Amendment 2600-95-7). The designation of "sensitive" by a Regional Forester carries a requirement to analyze the impacts of proposed projects and to develop conservation strategies where applicable (FSM 2670). Monitoring of species habitat status and additional surveys may also be needed. Forest Service sensitive species in the Northwest Forest Plan area are listed on Table 5-1 at the end of this biological evaluation. In the Northwest Forest Plan area, more than 450 species are listed as sensitive by Regions 5 and 6, including more than 350 plant species. Many of these species are associated with late-successional habitats.

Several vascular plants and amphibians listed as sensitive by the Forest Service are also listed as Survey and Manage species. Vascular plants with dual listing are: *Bensoniella oregana* (CA only), *Botrychium minganense*, *Coptis asplenifolia*, *Coptis trifolia*, *Corydalis aquae-gelidae*, *Cypripedium fasciculatum*, *Cypripedium montanum*, and *Galium kamtschaticum*. Vertebrates with dual listing are: Larch Mountain salamander, Siskiyou Mountains salamander, and great gray owl (CA only). These species would remain on the sensitive species list under all alternatives. None of the mollusks, fungi, lichens, or bryophytes on the Survey and Manage list are currently included on the Sensitive species lists for Region 5 or 6.

Known sites for these sensitive species would continue to be managed under all alternatives. The Forest Service conducts surveys for many sensitive species as needed in the areas where actions/ projects are proposed to occur. Where surveys are conducted, they have a reasonable probability of locating individuals and populations of these sensitive species, irrespective of whether surveys are conducted for Survey and Manage species. Since surveys for sensitive species will discover and subsequently protect them with or without the Survey and Manage mitigation measure, there would be no difference between the alternatives.

Most habitat managed under the Survey and Manage Standards and Guidelines is likely to be late-successional conifer forest. Therefore, for terrestrial sensitive species occurring within the Northwest Forest Plan area, but not associated with late-successional and old-growth forests, removing or modifying the Survey and Manage Standards and Guidelines would have no impact on these sensitive species.

For aquatic sensitive species, all projects proposed on National Forest System lands must meet the Aquatic Conservation Strategy objectives of the Northwest Forest Plan. As proposed projects are designed and analyzed for effects on aquatic species, species needs and habitat elements required to meet Aquatic Conservation Strategy objectives will be identified. The alternatives would not alter this assessment process; therefore, there would be no impact on sensitive aquatic species as a result of removing or modifying the Survey and Manage Standards and Guidelines under Alternative 2 or 3.

Given that approximately 80 percent of the Northwest Forest Plan area (and 86 percent of currently existing late-successional forests) is in reserves, most habitat used by late-successional and old-growth forest related terrestrial sensitive species are likely to be adequately protected by the reserve system. There may be greater uncertainty about some late-successional and old-growth forest related species, such as those with limited distribution or those that are highly intolerant of disturbance. However, the design of the reserve system provides some additional assurance that late-successional and old-growth forest related species are adequately protected by the reserve system. The reserve system generally provides the most reserves in those physiographic provinces that had the most late-successional forest historically and the least natural disturbance. The reserve system, coupled with requirements for protecting sensitive species, including pre-project clearances where warranted, provides ample protection for the habitat of

late-successional and old-growth forest related sensitive species.

Based on the above information, the impacts of all alternatives on terrestrial sensitive species associated with late-successional and old-growth forest habitat would be insignificant. This conclusion is based substantially on the fact that none of the alternatives would markedly alter the environmental baseline previously analyzed as part of the Northwest Forest Plan and subsequent analyses. In addition, none of the alternatives would impact the viability of any sensitive species. Therefore, for Forest Service terrestrial sensitive species, the determination for all alternatives is may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Summary

The Northwest Forest Plan Final SEIS Biological Assessment of species listed under the ESA assumed that the contribution to their survival from management of known sites for Survey and Manage species would be minimal. This conclusion was based on the assumptions that: (1) the amount of late-successional habitat that would be managed as Survey and Manage species known sites would be minimal compared to the 24 million acres of federally managed land included in the range of the northern spotted owl; (2) the actual locations of Survey and Manage species' sites were unpredictable at the time the Northwest Forest Plan consultation was conducted; and, (3) the managed sites are, mostly, in patches as small as 2 acres. The Biological Opinion completed under that consultation did not anticipate a specified amount of incidental take, but rather deferred the discussion of incidental take to consultation for specific and programmatic activities that would implement the Northwest Forest Plan.

The Northwest Forest Plan Final SEIS Biological Assessment stated that Survey and Manage mitigation measures were expected to retain acreage of late-successional forest throughout the range of the northern spotted owl; however, Survey and Manage sites were likely to occur in small patches and have a long-term effect similar to green-tree and old-growth retention provisions. Green tree and old-growth retention in watersheds will provide some benefit to spotted owls in the long term. Over a period of 100 years or so, these provisions will provide additional structural diversity to forest stands, which would improve the stand's ability to serve as owl habitat, even after being harvested (USDA, USDI 1994a, Appendix G, p. G-37). In the Biological Opinion (p. 12) from the U.S. Fish and Wildlife Service, Survey and Manage or Protection Buffer provisions are not specifically included in the environmental baseline for any of the species addressed.

Under both action alternatives, approximately 21,000 acres of forested habitat in Matrix and Adaptive Management Area land allocations would be returned to the underlying land allocation unless occupied by other species that warrant protection due to the removal of the Survey and Manage mitigation measure. The estimated 21,000 acres, as far as listed species are concerned, were never counted as protected habitat in the Biological Assessment for the Northwest Forest Plan (1994).

For the above-stated reasons, the analysis of effects for listed species from the Northwest Forest Plan Final SEIS concluded that no substantial contribution would accrue to listed species from the management of known sites for Survey and Manage species. The "release" of 21,000 acres of late-successional habitat to the underlying land allocation should not be considered as a change in the environmental baseline for listed species that was consulted for the Northwest Forest Plan. Hence, listed species would have no changes in their status and no adverse effects as a result of the action alternatives.

The action alternatives may affect but are not likely to adversely affect northern spotted owls and marbled murrelets and will have no effect on their designated critical habitat. The action alternatives may affect but are not likely to adversely affect bald eagle. The action alternatives will have no effect on California red-legged frog, Canada lynx, gray wolf, grizzly bear, plants, fish, and those listed or proposed species not associated with late-successional or old-growth

forests. The action alternatives are not likely to jeopardize the continued existence of or adversely modify proposed critical habitat for any plant proposed for listing. And, for aquatic sensitive species or sensitive species not associated with late-successional or old-growth forests, the action alternatives will have no impact. For other terrestrial sensitive species the action alternatives may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Signed

_____ _____

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USDA Forest Service and USDI Bureau of Land Management. 2001. Record of Decision for amendments to the survey and manage, protection buffer, and other mitigation measures standards and guidelines. Portland, Oregon.

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
AMPHIBIANS		
Aneides flavipunctatus	Black salamander	6
Batrachoseps attenuatus	California slender salamander	6
Batrachoseps wrighti	Oregon slender salamander	6
Dicamptodon copei	Cope's giant salamander	6
Plethodon elongatus	Del Norte salamander	6
Plethodon larsellii	Larch Mountain salamander	6
Plethodon stormi	Siskiyou Mountain Salamander	6
Plethodon vandykei	Van Dyke's salamander	6
Rana aurora aurora	Northern red-legged frog	5
Rana boylii	Foothill yellow-legged frog	5
Rana cascade	Cascade frog	5
Rana muscosa	Mountain yellow-legged frog	5
Rana pipiens	Northern leopard frog	5
Rana pretiosa	Oregon spotted frog	5/6
Rana luteiventris	Columbia spotted frog	6
Rhyacotriton cascadae	Cascade Torrent salamander	6
Rhyacotriton kezeri	Columbia Torrent salamander	6
Rhyacotriton olympicus	Olympic Torrent salamander	6
Rhyacotriton varriegatus	Southern Torrent salamander	5/6
BIRDS		
Accipiter gentilis	Northern goshawk	5
Aechmophorus clarkii	Clarke's grebe	6
Agelaius tricolor	Tricolored blackbird	6
Bartramia longicauda	Upland sandpiper	6
Branta candensis leucopareia		6
Bucephala albeola	Bufflehead	6
Buteo regalis	Ferruginous hawk	6
Buteo swainsoni	Swainson's hawk	5
Centrocerpus urophasianus phaios	Western sage grouse	6
Coccyzus americanus	Yellow-billed curlew	6
Coturnicops noveboracensis	Yellow rail	6
Cypseloides niger	Black swift	6
Empidonax traillii	Willow flycatcher	5
Empidonax wrightii	Gray flycatcher	6
Eremophila alpestris strigata		6
Falco peregrinus anatum	American peregrine falcon	6
Gavia immer	Common loon	6
Grus canadansis tabida	Greater sandhill crane	5/6
Histronicus histronicus	Harlequin duck	6
Ixobrychus exilis	Least bittern	6
Pipilo chlorurus	Green-tailed towhee	6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Podiceps auritus	Horned grebe	6
Podiceps grisegena	Red-necked grebe	6
Podiceps nigricollis	Eared grebe	6
Strix nebulosa	Great gray owl	5/6
Strix ocidentalis occidentalis	California spotted owl	5
Tympanuchus phasianellus	Sharp-tailed grouse	6
FISH		
Catostomus sp.	Salish sucker	6
Catostomus occidentalis lacusanserinus	Goose Lake sucker	5
Catostomus synderi	Klamath large-scale sucker	6
Cottus pitensis	Pit sculpin	6
Cottus tenuis	Slender sculpin	6
Gila bicolor orgonensis	Oregon Lakes tui chub	6
Gila bicolor thallassina	Goose Lake tui chub	5
Gila coerulea	Blue chub	6
Lampetra tridentata ssp.	Goose Lake lamprey	5
Lavina exilicauda chi	Clear Lake hitch	5
Mylophardon conocephalus	Hardhead	5
Oncorhynchus clarkii	Coastal run cutthroat trout	5
Oncorhynchus clarki clarki	Coastal cutthroat trout Puget Sound Olympic Peninsula Oregon Coast Southern Oregon Coast	6
Oncorhynchus clarki lewisi	Westslope cutthroat trout	6
Oncorhynchus keta	Chum salmon Puget Sound/Strait of Georgia Pacific Coast	6
Oncorhynchus kisutch	Coho salmon Puget Sound/Strait of Georgia Southwest WA/Lower Columbia River	6
Oncorhynchus mykiss	Interior redband trout	6
Oncorhynchus mykiss	Steelhead trout Klamath Mountain Province ESU N California Province ESU	5
Oncorhynchus mykiss aquilarum	Eagle Lake Rainbow trout	5
Oncorhynchus mykiss irideus	Steelhead trout Oregon Coast Klamath Mountain Province	6
Oncorhynchus mykiss pop 4	Warner Valley redband trout	5
Oncorhynchus mykiss pop 6	Goose Lake redband trout	5
Oncorhynchus mykiss pop 7	McCloud River redband trout	5

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Oncorhynchus nerka	Sockeye salmon Lake Pleasant Quinault Lake Baker River	6
Oncorhynchus tshawytscha	Chinook salmon Washington Coast Oregon Coast Southern Oregon Mid-Columbia River Summer/Fall Run Deschutes River Summer/Fall Run	6
Oncorhynchus tshawytscha	Chinook salmon Central Valley spring run ESU Central Valley fall run ESU S. OR and CA coastal ESU, spring run Upper Klamath/Trinity ESU, spring run Upper Trinity River ESU, fall run	5
Oregonichthys kalawatseti	Umpqua Oregon chub	6
Prosopium coulteri	Pygmy whitefish	6
Rhinichthys evermanii	Umpqua dace	6
Novumbra hubbsi	Olympic hubbsi	6
MAMMALS		
Antrozous pallidus	Pallid bat	5
Antrozous pallidus pacificus	Pacific pallid bat	6
Brachylagus idahoensis	Pygmy rabbit	6
Corynorhinus townsendii (Plecotus townsendii townsendii)	Townsend's or Pacific western big-eared bat	5/6
Gulo gulo luteus	California wolverine	5/6
Lasiurus blossevillii	Western red bat	5
Martes americana	American marten	5
Martes pennanti pacifica	Pacific fisher	5/6
Myotis thysanodes vespertinus	Pacific fringe-tailed bat	6
Sciurus griseus	Western gray squirrel	6
Sorex bairdii bairdii	Baird's shrew	6
Sorex bairdii permiliensis	Baird's shrew	6
Sorex pacificus cascadensis	Pacific shrew	6
Sorex pacificus pacificus	Pacific shrew	6
Thomomys mazama melanops	Western pocket gopher	6
Vulpes vulpes necator	Sierra Nevada red fox	5
INVERTEBRATES		
Anodonta californiensis	CA floater (freshwater)	5
Helisoma newberryi newberryi	Great Basin rams-horn (snail)	5
Juga (Calibasis) acutifilosa	Scalloped Juga (snail)	5
Juga (Calibasis) occata	Topaz Juga (snail)	5

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Pisidium (Cyclocalyx) ultramontanum	Montane peaclam	5
REPTILES		
Chrysemys picta	Painted turtle	6
Clemmys marmorata marmorata	Northwestern pond turtle	5/6
Contia tenuis	Sharptail snake	6
Lampropeltis getula	Common kingsnake	6
Lampropeltis zonata	California mountain kingsnake	6
Masticophis taeniatus	Striped whipsnake	6
VASCULAR PLANTS		
Abronia umbellata ssp. *breviflora*		6
Agoseris elata		6
Agrostis howellii		6
Allium peninsulare		6
Androsace elongata ssp. *acuta*		6
Anemone nuttalliana		6
Anemone oregana var. *felix*		6
Antennaria parvifolia		6
Antirrhinum subcordatum		5
Arabis macdonaldiana		5/6
Arabis modesta		6
Arabis sparsiflora var. *atrorubens*		6
Arabis suffrutescens var. *horizontalis*		6
Arctostaphylos hispidula		6
Arenaria paludicola		6
Arnica viscosa		6
Artemisia campestris ssp. *borealis* var. *wormskioldii*		6
Artemisia ludoviciana ssp. *estesii*		6
Asplenium septentrionale		6
Aster gormanii		6
Aster sibiricus var. *meritus*		6
Aster vialis		6
Astragalus agnicidus		5
Astragalus arrectus		6
Astragalus australis var. *olympicus*		6
Astragalus microcystis		6
Astragalus peckii		6
Astragalus tyghensis		6
Bensoniella oregana		5/6
Bolandra oregana		6
Botrychium ascendens		6
Botrychium campestre		6
Botrychium crenulatum		6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Botrychium minganense		6
Botrychium montanum		6
Botrychium paradoxum		6
Botrychium pedunculosum		6
Botrychium pinnatum		6
Botrychium pumicola		6
Brodiaea coronaria ssp. *rosea*		5
Calamagrostis breweri		6
Calochortus greenei		5
Calochortus howellii		6
Calochortus longebarbatus var. *longebarbatus*		5/6
Calochortus nutudus		6
Calochortus persistens		5
Calystegia atriplicifolia ssp. *buttensis*		5
Camassia howellii		6
Camissonia graciliflora		6
Campanula lasiocarpa		6
Campanula shetleri		5
Campanula wilkinsiana		5
Cardamine pattersonii		6
Carex anthoxanthea		6
Carex atrata var. *atrosquama* (WA tracks as *C. atrosquama*)		6
Carex atrata var. *erecta* (*C. heteroneura*)		6
Carex chordorrhiza		6
Carex circinata		6
Carex comosa		6
Carex crawfordii		6
Carex densa		6
Carex dioica var. *gynocrates* (WA tracks as *C. dioica*)		6
Carex flava		6
Carex gigas		6
Carex hystericina		6
Carex interior		6
Carex livida		6
Carex macrochaeta		6
Carex nervina		6
Carex norvegica		6
Carex obtusata		6
Carex pauciflora		6
Carex pluriflora		6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Carex proposita		6
Carex rostrata		6
Carex saxatilis var. *major*		6
Carex scirpoidea var. *scirpoidea*		6
Carex scirpoidea var. *stenochlaena*		6
Carex serratodens		6
Carex stenophylla (C. eleocharis)		6
Carex stylosa		6
Carex sychnocephala		6
Carex tenuifolia		6
Carex vallicola		6
Carex xerantica		6
Cassiope lycopodioides		6
Castilleja chlorotica		6
Castilleja cryptantha		6
Castilleja schizothricha		6
Castilleja thompsonii		6
Chaenactis suffrutescens		5
Chaenactis thompsonii		6
Cheilanthes intertexta		6
Chlorogalum angustifolium		6
Chrysolepis chrysophylla		6
Chrysosplenium tetrandrum		6
Cicuta bulbifera		6
Cimicifuga elata		6
Clarkia heterandra		6
Clarkia stellata		5
Claytonia lanceolata var. *pacifica*		6
Clintonia andrewsiana		6
Collinsia sparsiflora var. *bruceae*		6
Collomia mazama		6
Coptis aspleniifolia		6
Coptis trifolia		6
Cordylanthus maritimus ssp. *palustris*		6
Cordylanthus tenuis ssp. *pallescens*		5
Corydalis aquae-gelidae		6
Cryptantha milobakeri		6
Cryptantha rostellata		6
Cryptogramma stelleri		6
Cupressus bakeri		6
Cyperus bipartitus		6
Cypripedium fasciculatum		5/6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Cypripedium montanum		5
Cypripedium parviflorum		6
Damasonium californicum		6
Delphinium nudicaule		6
Delphinium viridescens		6
Dicentra pauciflora		6
Dodecatheon austrofrigidum		6
Draba aurea		6
Draba cana		6
Draba howellii		6
Draba longipes		6
Dryas drummondii		6
Dryopteris cristata		6
Epilobium nivium		5
Epilobium oreganum		5/6
Epilobium siskiyouense		6
Epilobium siskiyouense var. *arborescens*		6
Eriastrum brandegeae		5
Erigeron cervinus		6
Erigeron howellii		6
Erigeron oreganus		6
Erigeron peregrinus ssp. *peregrinus* var. *thompsonii*		6
Erigeron petrophilus		6
Erigeron salishii		6
Eriogonum alpinum		5
Eriogonum lobbii		6
Eriogonum nervulosum		5
Eriogonum pendulum		5
Eriogonum tripodum		5
Eriophorum chamissonis		6
Eriophorum viridicarinatum		6
Eritrichium nanum var. *elongatum*		6
Eryngium petiolatum		6
Erythronium citrinum var. *roderickii*		5
Erythronium elegans		6
Erythronium howellii		6
Eschscholzia caespitosa		6
Euonymus occidentalis		6
Festuca elmeri		6
Filipendula occidentalis		6
Frasera umpquaensis		5/6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Fritillaria camschatcensis		6
Fritillaria eastwoodiae		5
Fritillaria glauca		6
Fritillaria purdyi		6
Galium kamtschaticum		6
Gentiana douglasiana		6
Gentiana glauca		6
Gentiana newberryi var. *newberryi*		6
Gentiana plurisetosa		6
Gentiana setigera		5/6
Gentianella tenella		6
Geum rivale		6
Geum rossii var. *depressum*		6
Geum triflorum var. *campanulatum*		6
Hackelia hispida var. *disjuncta*		6
Hackelia taylorii		6
Hastingsia atropurpurea		6
Hastingsia bracteosa		6
Hazardia whitneyi var. *discoidea*		6
Heuchera grossulariifolia var. *tenuifolia*		6
Hesperolinon drymarioides		5
Horkelia hendersonii		5/6
Horkelia tridentata ssp. *tridentata*		6
Howellia aquatilis		5/6
Hydrocotyle verticillata		6
Iliamna bakeri		5
Iliamna latibracteata		6
Iliamna longisepala		6
Isopyrum stipitatum		6
Ivesia longibracteata		5
Ivesia pickeringii		5
Juncus leiospermus		5
Kalmiopsis fragrans		6
Keckiella lemmonii		6
Lathyrus biflorus		5
Lewisia cantelovii		5
Lewisia columbiana var. *columbiana*		6
Lewisia cotyledon var. *purdyi*		6
Lewisia leana		6
Lewisia oppositifolia		5
Lewisia stebbinsii		5
Lilium kelloggii		6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Lilium occidentale		6
Limnanthes floccosa ssp. *bellingeriana*		5/6
Limnanthes gracilis var. *gracilis*		6
Limonium californicum		6
Linanthus bolanderi		6
Linanthus harknessii ssp. *condensatus*		5
Linanthus nuttallii ssp. *howellii*		5
Liparis loeselii		6
Lobelia dortmanna		6
Lobelia kalmii		6
Loiseleuria procumbens		6
Lomatium engelmannii		6
Lomatium suksdorfii		6
Lomatium tracyi		6
Lomatium watsonii		6
Lotus stipularis		6
Lupinus antoninus		5
Lupinus aridus ssp. *ashlandensis*		5/6
Lupinus constancei		5
Lupinus sulphureus ssp. *kincaidii*		6
Lupinus tracyi		6
Luzula arcuata		6
Lycopodiella inundata		6
Lycopodium complanatum		6
Lycopodium dendroideum		6
Madia doris-nilesiae		5
Madia stebbinsii		5
Meconella oregana		6
Microseris borealis		6
Microseris douglasii ssp. *douglasii*		6
Microseris howellii		6
Microseris laciniata ssp. *detlingii*		6
Mimulus bolanderi		6
Mimulus evanescens		6
Mimulus jungermannioides		6
Mimulus pulsiferea		6
Mimulus suksdorfii		6
Mimulus tricolor		6
Minuartia decumbens		5
Minuartia rosei		5
Minuartia stolonifera		5
Monardella purpurea		6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Montia diffusa		6
Montia howellii		6
Navarretia tagetina		6
Nemacladus capillaris		6
Neviusia cliftonii		5
Nicotiana attenuata		6
Ophioglossum pusillum		6
Orcuttia tenuis		5
Oxytropis borealis var. *viscida*		6
Oxytropis campestris var. *gracilis*		6
Parnassia fimbriata var. *hoodiana*		6
Parnassia kotzebuei		6
Parnassia palustris var. *neogaea*		6
Pedicularis howellii		5/6
Pedicularis rainierensis		6
Pellaea andromedaefolia		6
Pellaea brachyptera		6
Pellaea breweri		6
Pellaea mucronata ssp *mucronata*		6
Penstemon barrettiae		6
Penstemon filiformis		5
Penstemon glaucinus		6
Perideridia erythrorhiza		6
Petrophyton cinerascens		6
Phacelia cookei		5
Phacelia greenei		5
Phacelia minutissima		6
Phlox hendersonii		6
Phlox hirsuta		5
Physaria didymocarpa var. *didymocarpa*		6
Pilularia americana		6
Pityopus californica		6
Plagiobothrys figuratus ssp. *corallicarpus*		6
Plagiobothrys glyptocarpus		6
Plantago macrocarpa		6
Platanthera chorisiana		6
Platanthera obtusata		6
Platanthera sparsiflora		6
Poa laxiflora		6
Poa nervosa var. *nervosa*		6
Pogogyne floribunda		5
Polemonium carneum		6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) within the Northwest Forest Plan area (Range of the Northern Spotted Owl).

Scientific Name	Common Name	Region
Polemonium chartaceum		5
Polemonium viscosum		6
Polystichum californicum		6
Potentilla breweri		6
Potentilla diversifolia var. *perdissecta*		6
Potentilla nivea		6
Potentilla quinquefolia		6
Potentilla villosa var. *parviflora*		6
Puccinella howellii		5
Raillardella pringlei		5
Raillardiopsis scabrida		5
Ranunculus cooleyae		6
Ranunculus populago		6
Ranunculus reconditus		6
Rhamnus ilicifolia		6
Ribes cereum var. *colubrinum*		6
Romanzoffia thompsonii		6
Rorippa columbiae		5/6
Rubus acaulis		6
Salix delnortensis		6
Salix glauca		6
Salix tweedyi		6
Salix vestita var. *erecta*		6
Sanguisorba menziesii		6
Sanicula marilandica		6
Sanicula tracyi		5
Saxifraga cernua		6
Saxifraga hitchcockiana		6
Saxifragopsis fragarioides		6
Scheuchzeria palustris		6
Scirpus pendulus		6
Scirpus subterminalis		6
Scribneria bolanderi		6
Sedum laxum ssp. *heckneri*		6
Sedum moranii		6
Sedum oblanceolatum		6
Sedum paradisum (= *S. obtusatum* ssp. *paradisum*)		5
Senecio flettii		6
Senecio hesperius		6
Sidalcea hirtipes		6
Sidalcea malachroides		6
Sidalcea malviflora ssp. *patula*		6

Table 5-1. Sensitive species in Forest Service Regions 5 (California) and 6 (Washington and Oregon) 1 within the Northwest Forest Plan area (Range of the Northern Spotted Owl). 1

Scientific Name	Common Name	Region
Sidalcea nelsoniana		6
Sidalcea oregana var. *calva*		6
Silene campanulata ssp. *campanulata*		5
Silene douglasii var. *oraria*		6
Silene hookeri ssp. *bolanderi*		6
Silene occidentalis ssp. *longistipitata*		5
Silene seelyi		6
Sisyrinchium sarmentosum		6
Sisyrinchium septentrionale		6
Smilax jamesii		5
Sophora leachiana		6
Spiranthes diluvialis		6
Spiranthes porrifolia		6
Streptanthus howellii		5/6
Suksdorfia violacea		6
Sullivantia oregana		6
Synthyris pinnatifida var. *lanuginosa*		6
Talinum sediforme		6
Tauschia howellii		5/6
Tauschia stricklandii		6
Teucrium canadense ssp. *viscidum*		6
Thalictrum dasycarpum		6
Thelypodium brachycarpum		6
Thermopsis robusta		5
Thlaspi californicum		5
Tracyina rostrata		5
Trillium angustipetalum		6
Triteleia hendersonii var. *leachiae*		6
Triteleia ixioides ssp. *anilina*		6
Triteleia laxa		6
Utricularia gibba		6
Utricularia intermedia		6
Vaccinium myrtilloides		6
Veratrum insolitum		6
Viola primulifolia ssp. *occidentalis*		5/6
Wolffia borealis		6
Wolffia columbiana		6
Woodwardia fimbriata		6

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