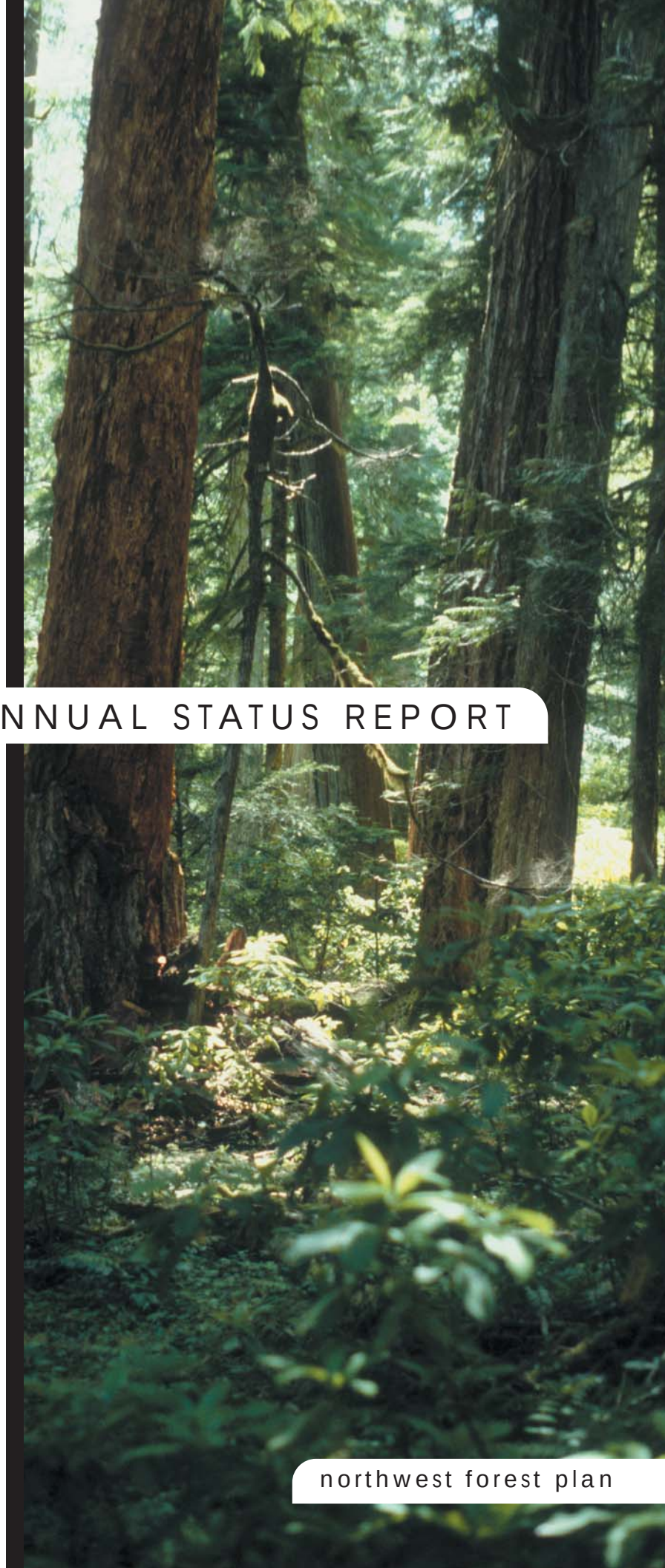
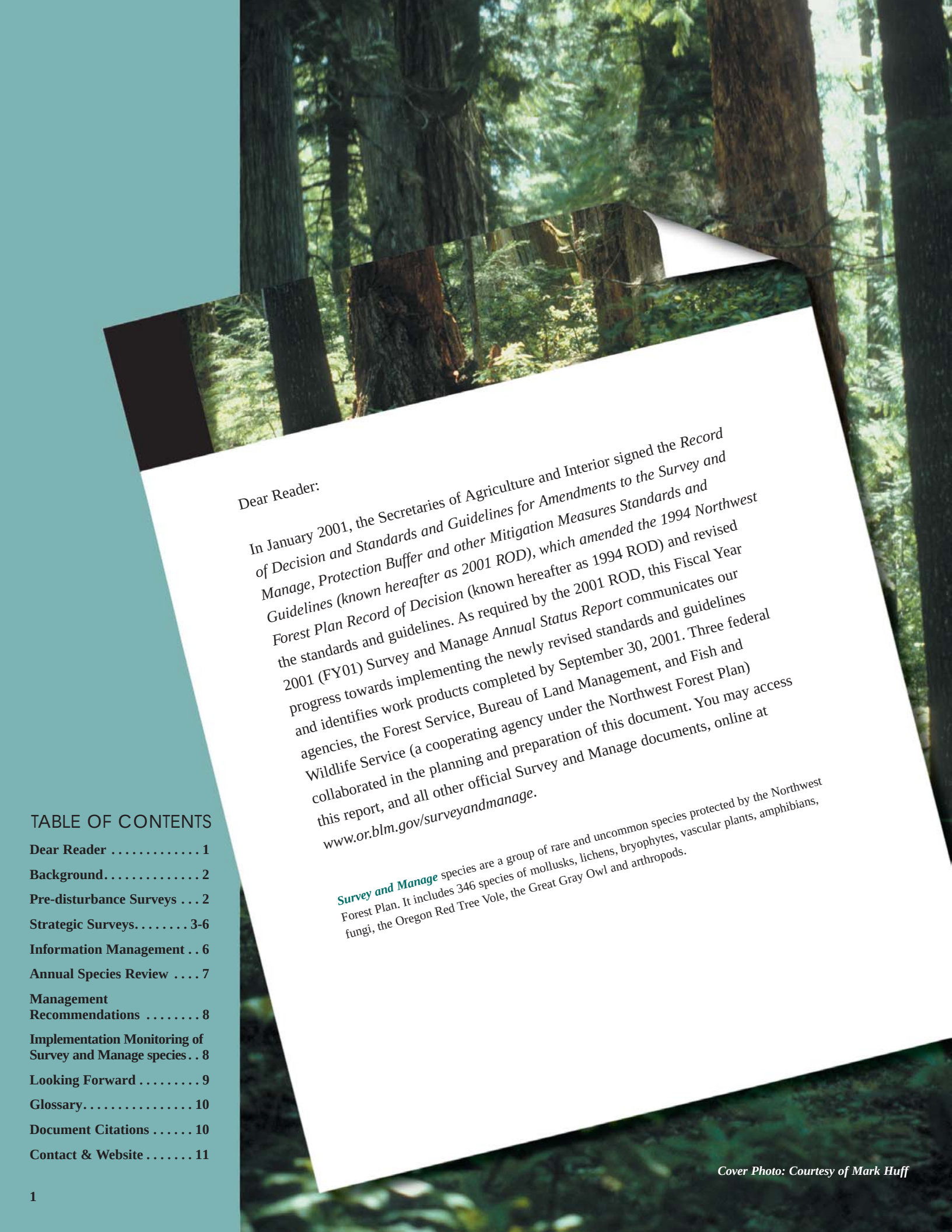
Survey & Manage

FISCAL YEAR 2001 ANNUAL STATUS REPORT



northwest forest plan



Dear Reader:

In January 2001, the Secretaries of Agriculture and Interior signed the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer and other Mitigation Measures Standards and Guidelines (known hereafter as 2001 ROD), which amended the 1994 Northwest Forest Plan Record of Decision* (known hereafter as 1994 ROD) and revised the standards and guidelines. As required by the 2001 ROD, this Fiscal Year 2001 (FY01) Survey and Manage *Annual Status Report* communicates our progress towards implementing the newly revised standards and guidelines and identifies work products completed by September 30, 2001. Three federal agencies, the Forest Service, Bureau of Land Management, and Fish and Wildlife Service (a cooperating agency under the Northwest Forest Plan) collaborated in the planning and preparation of this document. You may access this report, and all other official Survey and Manage documents, online at *www.or.blm.gov/surveyandmanage.*

Survey and Manage species are a group of rare and uncommon species protected by the Northwest Forest Plan. It includes 346 species of mollusks, lichens, bryophytes, vascular plants, amphibians, fungi, the Oregon Red Tree Vole, the Great Gray Owl and arthropods.

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Cover Photo: Courtesy of Mark Huff

BACKGROUND

In the *1994 ROD*, the Bureau of Land Management and Forest Service adopted standards and guidelines (S&Gs) for the management of habitat for late-successional and old-growth forest-related species within the range of the northern spotted owl. Specific S&Gs, called "Survey and Manage", addressed concerns for the persistence of rare and endemic species by providing for management of known sites, site-specific pre-habitat-disturbing surveys, and/or landscape scale surveys for about 400 rare and/or uncommon species.

As we discovered more about the occurrences and biological needs of these species, primarily through surveys, the agencies decided the original S&Gs needed some improvement. This led to the preparation of the *2001 ROD* which was signed by the Secretaries of Interior and Agriculture in January 2001. This decision removed 72 species from the Survey and Manage list in all or part of their ranges, established an *Annual Species Review* process to evaluate new information about taxa and make appropriate changes to their management, and required strategic surveys across the landscape for all species. It also created six management categories for 346 species, based on the ability to detect them in surveys, and whether they are rare or uncommon. Although the S&Gs were revised, the *2001 ROD* maintains the same likelihood of persistence for Survey and Manage species as the *1994 ROD*, while allowing more management flexibility to provide for the needs of the species.

To better implement the new S&Gs and improve efficiency in the program, the agencies created an interagency Survey and Manage team. Consisting of a Program Manager and four Coordinators, the team directs regional strategic surveys, pre-disturbance surveys, conservation planning efforts, and information management performed by agency species specialists, field survey crews, and data and GIS specialists. This restructuring allows us to better focus available resources on implementation of program S&Gs and product accomplishment. Each of these specific areas of the Program is discussed in the following pages.

We will continue to provide annual Survey and Manage status reports to keep you informed of our progress.

PRE-DISTURBANCE SURVEYS

Pre-disturbance surveys are "clearance surveys" done for projects that may disturb species habitats. They are conducted prior to signing National Environmental Policy Act of 1969 (NEPA) decisions with the goal of reducing the potential loss of sites by searching specified habitats.

Pre-disturbance surveys utilize a variety of survey methods to focus on priority habitats, habitat features, or entire project areas. These surveys must adhere to protocols developed for individual species. During FY01, survey protocol revisions were initiated for terrestrial mollusks and the red tree vole. Efforts were also begun to develop survey protocols for eight lichen species.

There are two types of pre-disturbance surveys based on individual species characteristics. *Practical surveys* are developed for species that have characteristics making them likely to be located with a reasonable survey effort. Practical surveys were limited to 67 species in FY01.

Equivalent-effort surveys are developed for species that have characteristics, such as extremely small size or irregular life cycles, making identification during pre-disturbance surveys less likely. Equivalent-effort surveys are currently limited to eight species of mollusks.

Information collected during pre-disturbance surveys includes detailed location and habitat data. These data, along with information collected from Strategic Surveys, are used to develop or revise management recommendations, revise survey protocols and complete the Annual Species Review. According to the Interagency Species Management System (ISMS) database, field offices recorded surveys on 539,075 acres in 2001[1]. Administrative units also recorded a total of 17,303 known sites in the ISMS database in 2001 for 177 different taxa. Table 1 displays the total number of known sites located in 2001 and entered into the ISMS database for both the Forest Service and Bureau of Land Management.

Table 1.	Known Sites Discovered in FY2001			
	Forest Service		**Bureau of Land Management**	
	Region 5	Region 6	CA[2]	OR/WA
Fungi	213	2447	0	3199
Lichens	0	357	0	753
Bryophytes	62	665	0	275
Vascular Plants	9	150	0	94
Mollusks	1943	2201	0	2843
Amphibian	207	1420	0	79
Great Grey Owl	0	133	0	286
Red Tree Vole	10	412	0	827
Total	**2444**	**6507**	**0**	**8356**

[1] This is less than the actual areas surveyed since all field offices do not record pre-disturbance survey locations in the ISMS database.

[2] The California BLM was not able to record their known sites into ISMS by the end of FY01 due to technical problems with their computer systems.

STRATEGIC SURVEYS

What are Strategic Surveys?

Strategic surveys gather information on Survey and Manage species that relate to the management objectives for each species. They examine the level of management that a given species needs to be assured of persistence in its habitat. These surveys range in scale from small-scale, site-specific surveys that collect habitat data at known species locations, to large-scale, multiple-species landscape surveys that collect species distribution information. Strategic surveys differ from "pre-disturbance" surveys because they are focused on gathering information about the species and its habitat requirements and are not associated with a proposed habitat-disturbing project. Information collected from these surveys will be used in the *Annual Species Review* process and development of management recommendations and survey protocols.

Why do we conduct them?

Strategic surveys are required by the *2001 ROD* for all Survey and Manage species. These surveys collect information on the species range, distribution, and habitats. Strategic surveys can help answer the following questions:

1. Is there a concern for *species persistence*?
2. Is the species rare or uncommon?
3. Is the species closely associated with *late-successional / old-growth forests?*
4. Do the reserve land use allocations and other standards and guidelines provide for *persistence*?

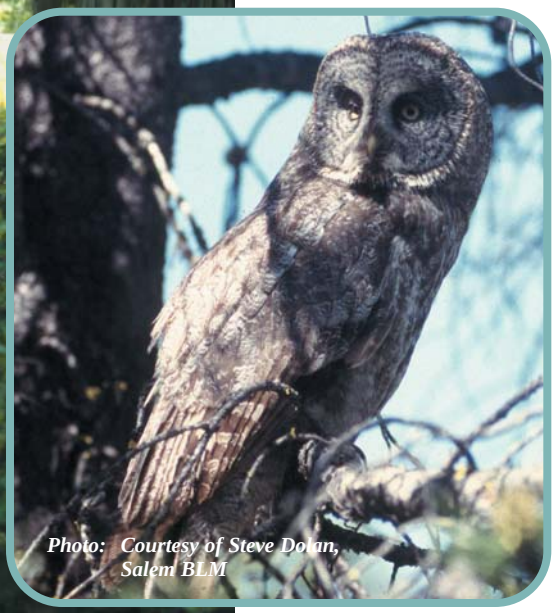


Photo: Courtesy of Steve Dolan, Salem BLM

Types of Strategic Surveys

Surveys on randomly selected *Current Vegetation Survey/Forest Inventory Assessment (CVS/FIA)* plots are surveyed for fungi, lichens, bryophytes, vascular plants, mollusks and red tree voles based on land use allocation *(reserve vs. matrix)* and habitat *(late-successional/old-growth vs. non-late-successional/old-growth).*

Known Site Surveys collect habitat and vegetation data at known locations of Survey and Manage species.

Purposive Surveys are conducted in habitats that are likely to contain a species, with the goal of locating additional sites. These surveys are used to find sites of the rarest species that may not have been detected in random plots.

Habitat Modeling uses various methods to model species habitat at different spatial scales. These scales range from large landscape models to the micro-site scale model. Large-scale habitat models use data collected from known site surveys to develop potential habitat maps and can also be used to identify areas where future strategic surveys can be conducted. These maps are then field tested and validated. Once these models are validated, they can estimate the amount of potential habitat available for that species. Micro-site habitat modeling estimates the likelihood a species is present at a specific location.

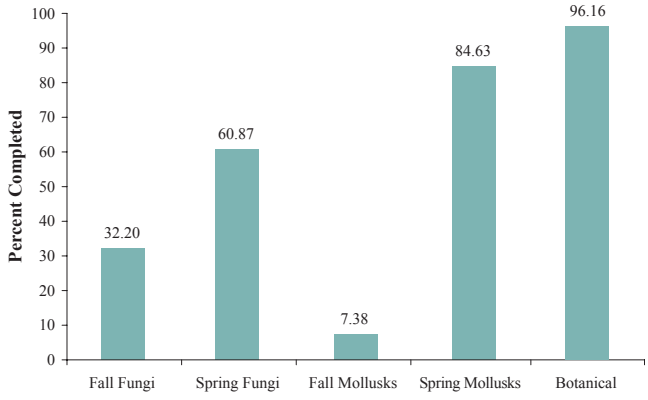
Strategic Survey Accomplishments in Fiscal Year 2001

The Strategic Survey accomplishments for FY01 were extensive, greatly expanding our knowledge of species and their habitats within the Northwest Forest Plan areas.

Random Grid Surveys are being conducted on a total of 635 CVS/FIA plots for fungi, 488 plots for mollusks and 730 plots for botanical species (e.g. vascular plants, lichens and bryophytes). Figure 1 shows the percentage of survey visits completed at the end of FY01. The field surveys are expected to be completed by FY03 for all taxa groups.

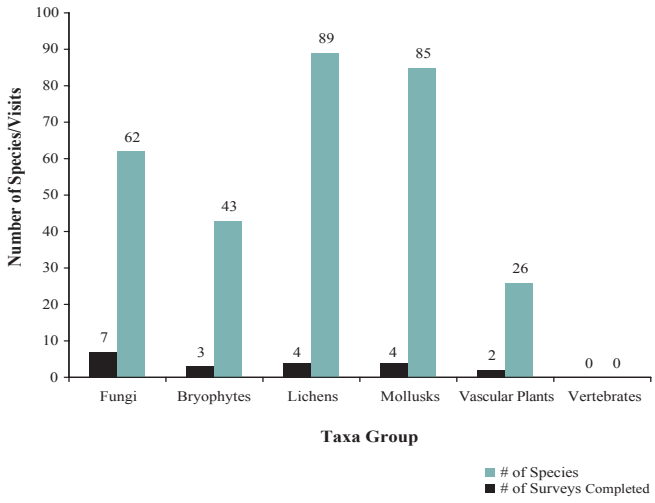
In addition, a contract was awarded to randomly survey for Red Tree Voles on 400 plots throughout the species range, beginning in FY02.

Figure 1. Percent Survey Visits Completed of Random Grid Survey up to October 1, 2001



Known Site Surveys - A total of 305 known site surveys for 20 species were completed in Fiscal Year 2001 (Figure 2).

Figure 2. Known Site Surveys Completed Fiscal Year 2001



Purposive Surveys - 4,000 acres were surveyed for three bryophyte and one mollusk species. In addition, a contract was awarded to conduct surveys for Shasta salamanders in Northern California.

Habitat Modeling - Modeling for species habitat can provide answers to questions regarding species persistence. In FY01 habitat modeling efforts occurred for species in all taxa groups, using a variety of habitat models. One effort that continued into FY02 includes modeling potential habitat using the Potential Natural Vegetation (PNV) model, currently examining 11 species (Table 1).

Habitat modeling efforts were initiated in FY01 for Siskiyou Mountain salamander, Larch Mountain salamander and Van Dyke's salamander.

As a result of the strategic surveys in northern California in 1999 and 2000, modeling efforts continued in FY01 to determine the extent of mollusk species geographic ranges and potential habitats.

Table 2. PNV-based spatial habitat model work in Fiscal Year 2001 for Survey and Manage species.

Species	Taxa Group	Model Status	Species Range	Geographic Coverage of Model
Coptis asplenifolia *Spleenwort-leaved Goldthread*	Vascular Plant	Validation Model	NW Washington	Mount Baker-Snoqualmie NF
Plantanthera orbiculata *Large Round-leaved Orchid*	Vascular plant	Field calibrated	Mount Baker-Snoqualmie NF	Mount Baker-Snoqualmie NF
Hypogymnia duplicata *No common name*	Lichen	Preliminary validation model	NW Washington to NW Oregon	Mount Baker-Snoqualmie NF
Lobaria linita *Cabbage lungwort*	Lichen	Field calibrated	NW Washington to NW Oregon	Mount Baker-Snoqualmie NF
Pseudocyphellaria rainierensis *Old Growth Speckle Belly*	Lichen	Preliminary calibration model	Western Washington and Oregon	Mount Baker-Snoqualmie NF
Bridgeoporus nobilissimus *Giant polypore*	Fungi	Preliminary validation model	Western Washington and Oregon	Western Washington and Oregon
Bondarzewia mesenterica *No common name*	Fungi	Preliminary habitat model	NFP area west of Cascade Range	Western Washington and Oregon
Hemphillia malone *Malone jumping slug*	Mollusk	Preliminary habitat model	SW Washington and NW Oregon	SW Washington and NW Oregon
Cryptomastix devia *Puget Oregonian*	Mollusk	Preliminary habitat model	SW Washington and NW Oregon	SW Washington and NW Oregon
Plethodon vandykei *Van Dyke's Salamander*	Amphibian	Preliminary habitat model	SW Washington	SW Washington
Aborimus longicaudus *Oregon Red Tree Vole*	Mammal	Preliminary habitat model	Western Oregon and NW California	Western Oregon

STRATEGIC SURVEYS

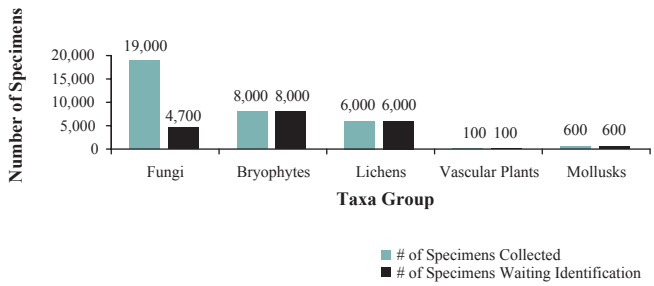
Research - Funding was provided for specific projects that examined alternative ways to conduct surveys for multiple species/taxa groups across large geographic areas. Table 2 shows the research projects that were funded through the Strategic Survey program.

Table 3.	Fiscal Year 2001 Strategic Survey Research Projects
The value of leave islands with old forest remnants as refugia for sensitive plant and animal species in managed forests. Stephanie J. Wessell, Deanna H. Olson and Richard A. Schmitz, Pacific Northwest Research Station, U.S. Forest Service, Corvallis, OR	
Effects of alternative habitat-based management regimes on Survey and Manage lichens. John Cissel, Linda Geiser and Bruce McCune, U.S. Forest Service; Oregon State University, Corvallis, OR	
Fundamental research on broad-scale strategies for ensuring persistence of Survey and Manage species. David Boughton, Pacific Northwest Research Station, Corvallis, OR	
Enhancing our capability to detect Survey and Manage fungal species by analysis of existing datasets. Tina A. Dreisbach and Jane E. Smith, Pacific Northwest Research Station, Corvallis, OR	
Survey and Manage hotspots in the Klamath Province: Relationships to land allocation and environmental gradients. William J. Zielinski, Hartwell Welsh, Jeffrey Dunk and Lisa Ollivier. Pacific Southwest Research Station, U.S. Forest Service, Arcata, CA.	
Risk assessment methodology in Survey and Manage species. George Weaver. Pacific Northwest Research Station, Corvallis, OR	
A sample design framework for Survey and Manage species under the Northwest Forest Plan. Richard Cutler, Thomas C. Edwards, Jr., Jim Alegria, Dan McKenzie. Utah State University, Logan, UT; BLM State Office, Portland, OR; U.S. Geological Service, Corvallis, OR.	
Survey and Manage species under the Pacific Northwest Forest Plan: analysis of lichens. Thomas C, Edwards, Jr., Richard Cutler, Jim Alegria, Linda Geiser, and Dan McKenzie. Utah State University, Logan, UT; BLM State Office, Portland, OR; U.S. Forest Service, Corvallis, OR; U.S. Geological Service, Corvallis, OR.	

STRATEGIC SURVEYS

Strategic Survey Specimen Collections and Identification - Approximately 34,000 specimens (fungi, lichens, bryophytes, vascular plants and mollusks) have been collected while conducting strategic surveys. Additional specimens have been collected from pre-disturbance surveys. Figure 3 shows the approximate number of specimens by taxa group. The number of known sites of Survey and Manage species will not be known until all the field surveys have been completed and the specimens have been identified.

Figure 3. Estimated Number of Specimens Collected from Strategic Surveys and Waiting Identification - Fiscal Year 2001

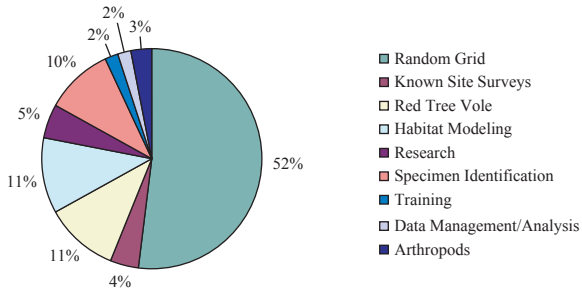


Data Analysis - Information collected from statistical surveys in FY01 will help address fundamental questions regarding abundance and distribution of Survey and Manage species. These data will be analyzed in FY02, and used in the *Annual Species Review* to evaluate the latest information and propose changes in management, as appropriate. Information collected at known site surveys conducted in 2000 is being used in the PNV spatially-based habitat models. Known site surveys that were conducted in 2001 will be analyzed in 2002.

Strategic Survey Implementation Guide - (SSIG) This document displays the Strategic Survey information needs for all Survey and Manage species. Updated annually, the SSIG helps focus agency resources on the highest priority species information needs and helps to ensure that the agencies comply with the deadlines imposed by the *2001 ROD* standards and guidelines. The 2002 SSIG was initiated during FY01 and completed in FY02, and will be discussed in the FY02 Annual Status Report. It is now accessible on the BLM Northwest Forest Plan Survey and Manage website at *www.or.blm.gov/surveyandmanage*.

2001 Budget - Funding for random grid surveys amounted to 52% of the total FY01 Strategic Survey program budget. The remaining funds were used for studying red tree voles conducting habitat modeling and specimen identification. Figure 4 shows how the strategic survey funding was spent.

Figure 4. Strategic Survey Budget - Fiscal Year 2001



INFORMATION MANAGEMENT

Powerful Information Technologies Empower Educated Decisions

The Forest Service and the BLM initially gathered location data for Survey and Manage species from herbariums, museums, and National Forest and BLM District staffs. This information was compiled into the *Known Sites Database*. This simple database has since been replaced by the *Interagency Species Management System (ISMS)*, developed over several years and deployed in the field in March of 2000.

The Interagency Species Management System

The ISMS database holds information on Survey and Manage species and their habitats, plus information about where surveys have occurred. The robust Oracle/ArcView application has about 480 users in the Forest Service, BLM and Fish and Wildlife Service. Biologists and other staff have entered approximately 62,000 records of known sites for all Survey and Manage species.

Much of the initial data were in a backlog: it had been collected, but not entered, into digital media originating from the early field surveys of the Northwest Forest Plan. By 2001, the majority of these data had been entered into the ISMS. Included in this database are sites discovered during field work prior to proposed land management activities (such as timber sales and recreation trails), and those sites discovered during Strategic Surveys.

The ISMS team

The ISMS team at Portland, Oregon is responsible for maintaining the ISMS application; providing training and support to the ISMS users; developing ease-of-use improvements to the ISMS; and implementing the data requirements of the *2001 ROD*. In fiscal year 2001, the team provided training sessions, developed some database improvements and led field office users in data quality assurance activities. The ISMS team also provided database query support for the specialists and managers involved in the *Annual Species Review* of the Survey and Manage species.

ANNUAL SPECIES REVIEW

Flexible Species Management

The *Annual Species Review* (ASR) is one of the adaptive management provisions under the 2001 ROD. The purpose of the ASR is to evaluate new emerging information on individual species, and serves as the means for adding, removing, or changing species management within Survey and Manage. The ASR allows adjustment to species management necessary for achieving persistence objectives in the Northwest Forest Plan.

The *Annual Species Review* Process

The process for the ASR is outlined in the *2001 ROD.* The first step determines if substantial new information has accumulated on individual species since the last Review. Second, the analysis of newly acquired species data is combined with current information to provide complete documentation of our knowledge of the species. In the third step, the available information is evaluated and the 2001 S&Gs criteria are applied to determine if the species should be included or removed, or if a shift in management is warranted. The Intermediate Management Group then reviews these results, formulates options, and proposes appropriate management changes for each species to the Regional Interagency Executive Committee (RIEC). The RIEC, a committee composed of federal regulatory and land-management agencies, examines the proposals and determines if the new information is used properly in the review of the species. When the review is complete, and it is determined that the effects of the recommended changes are within the original scope of the Northwest Forest Plan, the RIEC develops a "finding" of appropriate management changes. The BLM and Forest Service approve the proposed changes for their respective agencies.

Photo: Courtesy of Nan Vance

The final ASR results for FY01 were released in June, 2002, and will be included in the FY02 Annual Status Report. No species were reviewed for addition to Survey and Manage during the 2001 ASR; additions will be considered during the 2002 ASR.

MANAGEMENT RECOMMENDATIONS

What are they?

Management recommendations (MRs) are guidelines for managing Survey and Manage species on federal lands within the Northwest Forest Plan area. These guidelines establish specific goals and objectives for the species and general management policy for providing a reasonable assurance of species persistence at the known site-scale. The guidelines also describe species' life history, characteristics, and habitat relations. Under the provisions of the *2001 ROD*, new broad-scale MRs are written for certain species which tend to have high numbers of known sites, less restrictive distribution patterns relative to their ranges, or moderate-to-broad ecological amplitude. Not all known sites of these species are likely to be necessary for a reasonable assurance of persistence. In addition, in the geographic area covered by the Northwest Forest Plan where fires occur frequently, MRs are being developed to allow fuels-reduction treatments (as directed by the National Fire Plan) to help reduce the risk of large-scale or high intensity fires.

New and Revised Management Recommendations

In the *1994 ROD*, Survey and Manage species were organized into one or more of four categories regarding the type of management and surveys required. The *2001 ROD* created six management categories for these species, based on the ability to find them in surveys, and whether they are rare or uncommon. Due to these changes many species now require the creation or revision of MRs. Currently, all but 21 Survey and Manage species are required to have MRs. These 21 species are exempt from this requirement because they are uncommon and information is insufficient to determine specific criteria for persistence or association with late-successional and old-growth forest.

Management recommendations are being written or revised for 128 species. This includes twenty-four species targeted for broad-scale MRs to identify which sites are needed to assure species persistence. Most of the work on these MRs was initiated in FY01 and draft documents are scheduled for completion in FY02.

IMPLEMENTATION MONITORING OF SURVEY AND MANAGE SPECIES

The primary objective of implementation monitoring for Survey and Manage species is to determine to what extent agencies have complied with the *2001 ROD* standards and guidelines. Using a standard questionnaire format, FY01 reviews were conducted on 21 watersheds and 21 projects, randomly selected throughout the Northwest Forest Plan area. Questions addressing Survey and Manage species from previous reviews were modified to reflect the requirements of the *2001 ROD* standards and guidelines.

The results of FY01 watershed implementation monitoring reviews show that 18 of the 21 field units managing the sampled watersheds contain known sites of Survey and Manage species. In addition to surveys, local databases, historical records, and Interagency Species Management System (ISMS) records were used to determine if known sites for Survey and Manage species existed within the watershed. All 18 field units with known sites used existing Management Recommendations (MRs) to manage known sites, or as in the two cases where there were no MRs available, management direction was obtained from the *2001 ROD, Appendix J-2* and species experts. All units that conducted pre-disturbance surveys reported that they were conducted to established protocols. The FY01 Implementation Monitoring Report is in development, and is expected for release in the near future. Monitoring information is accessible online at *www.reo.gov/monitoring.*

Results of implementation monitoring reviews provide critical feedback to the agencies and allow us to evaluate our progress toward meeting species persistence objectives.

Photo: Courtesy of Mark Huff

LOOKING FORWARD

We expect species to be removed from Survey and Manage as new information regarding species abundance, range and habitat needs show that some species do not require the additional mitigation afforded by the *2001 ROD*. We also anticipate that some species may be added to Survey and Manage as new rare species are discovered in late-successional and old-growth forests. Overall, we estimate that the total number of species provided for by Survey and Manage should continue to decrease in the short term and then stabilize.

Both project clearance surveys and strategic surveys are expected to decline as species are removed from Survey and Manage. Strategic surveys will decrease also as the criteria for completion of surveys are met (*2001 ROD Standards and Guidelines-30*). Our coarse grained, broad survey of all 24,500,000 acres of the Northwest Forest Plan area will be essentially completed in FY02. During FY03 we anticipate a greater reliance on other strategic survey methodology, such as modeling, using more refined filters to focus our efforts on the rarest species.

As new and revised management recommendations and survey protocols are completed in the next year or two, we expect the need for new or revised MRs and survey protocols to decrease sharply.

The Survey and Manage program will continue to emphasize coordination with the field units to help them achieve other Northwest Forest Plan objectives by using flexibilities provided in the *2001 ROD*.

We have already learned a tremendous amount about many Survey and Manage species through effective implementation of the program's standards and guidelines. We have also made better-informed decisions to more appropriately manage these species because of our increased knowledge. Continuing our efforts will help us realize our goal of assuring the biological components of old-growth forest ecosystems persist, *well-distributed* across the Northwest Forest Plan area well into the future.

GLOSSARY

CVS/FIA plots: Fixed plots maintained by the USFS/BLM to measure vegetation changes over time that represent the landscape.

Late-successional forests: Forest stands consisting of trees, structural attributes, supporting biological communities, and processes associated with old-growth and/or mature forests. It also refers to forest seral stages that include mature and old-growth age classes. 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 (2001 ROD).

Matrix: Federal lands outside of reserves, withdrawn areas, Managed Late-Successional and Adaptive Management Areas (2001 ROD).

Old-growth forests: 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. Old-growth forests have the following characteristics: 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; a 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) (2001 ROD).

Persistence: (as in persistence objective for a species)-Defined in the 1994 Northwest Forest Plan (1994 ROD) as the key management objective for late-successional and old-growth associated species. If a given species meets a certain set of criteria (*2001 ROD, Standards and Guidelines-5*) they are either considered to be a "concern" or of "little or no concern for persistence".

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 (2001 ROD).

Standards and guidelines (S&Gs): written directions from the decision document, such as the 2001 ROD, that must be applied to federal public lands administered by the Bureau of Land Management and the Forest Service within the Northwest Forest Plan area.

Taxa (taxon, singular): A category in the scientific classification system, such as a class, family, phylum, species, subspecies, or race (2001 ROD).

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 (2001 ROD).

DOCUMENT CITATIONS

Appendix J-2: *USDA Forest Service and USDI Bureau of Land Management. 1994a. Final supplemental environmental impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl (Northwest Forest Plan). Portland, Oregon. Vols. I & II, and Appendix J-2 Results of Additional Species Analysis. var. p.[FSEIS]*

PNV model: *A Gradient Model for Predicting Environmental Variables and Units of Potential Natural Vegetation across a Landscape. In Prep. Jan A. Henderson, Mt. Baker Snoqualmie National Forest, Mountlake Terrace, WA. Revised November 2001.*

1994 ROD: *USDA Forest Service and USDI Bureau of Land Management. 1994b. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, Standards and Guidelines for Management of Habitat for Late-successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Portland, Oregon. var. p.[Northwest Forest Plan].*

2001 ROD: *USDA Forest Service and USDI Bureau of Land Management. 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. Portland, Oregon. var.p. [ROD ii + 59 p; S&Gs ii +86 p]*

CONTACT & WEBSITE

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