Draft Conservation Strategy Format

To be used for Conservation Strategies created
for Region 6 Forest Service and/or Oregon/Washington BLM

May, 2006

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OUTLINE

Draft Conservation Strategy Format

(May 2006)

The outline provided below lists the key components that should be included in Conservation Strategies created by/for Oregon/Washington BLM and/or Forest Service Region 6. This outline is meant to apply to a wide range of taxa, and is therefore generic in nature. However, some of the information presented in the outline may not be applicable all taxa.

This outline should be followed for any Strategy initiated after June 15, 2006. Comments on this outline will be accepted until June 15, 2007. After that date, a final format will be released. Please send any comments on this format to Rob Huff, interagency Conservation Planning Coordinator (rob_huff@or.blm.gov , 503-808-6479).

A Conservation Strategy is an extension of a Conservation Assessment focusing on

- where to manage habitat and/or species' sites,
- how to manage those areas, and
- when and where to modify management of sites or the Strategy.

Conservation Strategies require peer review and management approval to be considered final and complete.

The Conservation Strategy format and outline builds upon the Draft Conservation Assessment Format, adding or replacing key topics that help guide management for the species. When there is an existing Conservation Assessment for a species, the Assessment can be modified to become a Conservation Strategy by updating the information to reflect new findings and addressing the new key topics.

Topics denoted by an asterisk (*) below are new or the content included here replaces or updates that described in the Draft Conservation Assessment format. All other topics are similar in content to those in the Draft Conservation Assessment Format.

OUTLINE
Draft Conservation Strategy Format

***Title Page**
***Table of Contents**
Disclaimer
Executive Summary:

- Species and Taxonomic Group
- Management Status
- Range and Habitat
- Threats
- *Conservation
- Research, Inventory, and Monitoring Opportunities
- *Adaptive Management

List of Tables and Figures

I. Introduction

- *Goal
- *Scope
- Management Status

II. Classification and Description

- Systematics and Synonymy
- Species Description (technical and/or non-technical)

III. Biology and Ecology

- *Life History
- Activity Patterns and Movements
- Food Habits
- *Range, Distribution, and Abundance
- Population Trends
- *Demography
- Habitat
- Ecological Considerations

***IV. Conservation**

- Threats to Species
- *Conservation Objective
  *Selection of Management Areas
    -Assumptions
    -Distribution, Connectivity, and Landscape Considerations
    -Management Area Selection Criteria
    -Intermediate Management Scales
    -Specific Management Area Selections
    -Surveys, Incidental Detections
    -Other Conservation Opportunities
- *****Management Area Requirements

V. Research, Inventory, and Monitoring Opportunities

***VI. Adaptive Management**
Definitions of Terms Used (Glossary)
Acknowledgments
References
Appendices (if needed)

Draft Conservation Strategy Format
(May, 2006)

This format describes the key components that should be addressed in Conservation Strategies created by/for Oregon and Washington BLM and/or Forest Service Region 6. For each item listed in the outline (previous page) a more thorough discussion is included here.

Current and available information is to be used to complete the Strategy. New data collection, or the funding and completion of new research, inventories, or monitoring, is not necessary. Throughout the document, list appropriate texts or references to pursue for further information.

The document should follow the format displayed below, including the font size, titles, indentations, paragraph style, and section format. Font type preferred is Times New Roman.

Title Page

List the name of the species (scientific and common, where applicable), the date of creation, the authors, and the agencies or administrative units covered. A brief description of the authors' affiliations may also be added.
(Example)

Conservation Strategy

for

Siskiyou Mountains Salamander

(*Plethodon stormi*)

7/25/2005

David R. Clayton, Deanna H. Olson, and Richard S. Nauman

USDA Forest Service Region 6 and
USDI Bureau of Land Management, Oregon and Washington

Table of Contents

Use the topic headings in the order displayed in the below example.

(Example)

TABLE OF CONTENTS

Disclaimer

Executive Summary

List of Tables and Figures

I. Introduction

A. Goal

B. Scope

C. Management Status

II. Classification and Description

A. Systematic and Synonymy

B. Species Description (technical and/or non-technical)

III. Biology and Ecology

A. Life History

B. Activity Pattern and Movements

C. Food Habits

D. Range, Distribution, and Abundance

E. Population Trends

F. Demography

G. Habitat

H. Ecological Considerations

IV. Conservation

A. Threats to Species

B. Species Conservation Objective

C. Selection of Management Areas

D. Management Area Requirements

V. Research, Inventory, and Monitoring Opportunities

VI. Adaptive Management

Definitions of Terms Used (Glossary)

Acknowledgments

References

Appendix A XXXXY WWXXY

Disclaimer

Establish the limitations of the information and a mechanism for how an individual would share newly collected or analyzed information.

(Example**)**
This Conservation Strategy was prepared to compile information on (the subject taxon or community). This Strategy does not represent management direction or a management decision by the U.S. Forest Service (Region 6) or Bureau of Land Management (OR/WA BLM). Although the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon or community, please contact the interagency Special Status/Sensitive Species Conservation Planning Coordinator in the Portland, Oregon Forest Service Region 6 and OR/WA BLM offices. Please see the interagency website (www.or.blm.gov/isssp) for contact information.

Executive Summary

The Executive Summary should be brief, generally 1 page, and address the following items: Species and Taxonomic Group, Management Status, Range and Habitat, Threats, Conservation, Research, Inventory, and Monitoring Opportunities, and Adaptive Management. Following is a brief description of the appropriate amount of detail to be included for each.

Species and Taxonomic Group

List the species name (scientific and common, if applicable) and the taxonomic group (for instance, Amphibians).

Management Status

Indicate the current Special Status/Sensitive Species designation by Region 6 and OR/WA BLM, federally listed or candidate species status under the Endangered Species Act, and any special State designations. Should include NatureServe and Natural Heritage Program Global, National, State and subspecies (if applicable) ranks in the document but please refer reader to a website where updated information/status about this species may be found, since ranks can change. Also include a reference to where updated Special Status/Sensitive Species lists are maintained to alert the reader that OR/WA BLM or Region 6 management status may change (the interagency website, http://www.or.blm.gov/isssp/).

Range & Habitat

Briefly describe the current global distribution. Briefly describe the current regional distribution and abundance. Summarize the important physical and biological habitat characteristics for this species.

Threats

Summarize the threats to the long-term conservation of this species globally/range-wide and in Region 6 and OR/WA BLM. Include information that indicates whether the majority of habitat and/or sites for the species occur on federal or non-federal lands.

Conservation

Briefly state the Conservation Objective. Summarize recommendations on where/when sites or habitat should be managed; and how those sites or habitat should be managed.

Research, Inventory, and Monitoring Opportunities

Summarize the main practical, efficient inventory and monitoring schemes that will address information gaps that, if filled, would help in providing for the conservation of the species. These are not required actions.

Adaptive Management

Briefly describe when modifications to management of this species should occur.

List of Tables and Figures

List the Tables and Figures used throughout the Conservation Strategy, indicating which pages they are on.

I. Introduction

A. Goal

State the goal of this strategy and how it relates to the larger Special Status/Sensitive Species (SSSS) Programs. Sample language:

The goal of this Conservation Strategy is to summarize existing information regarding the biology and ecology of (fill in species common and scientific name), threats to the species, and to identify a management strategy (or strategies) for this species to meet agency policy objectives. This species is of concern due to (briefly list life history characteristics that contribute to concern for the species (e.g. its highly restricted distribution, narrow habitat requirements with habitat associations that appear to differ across its range, complex genetic structure of multiple discrete genetic lineages that may be recognized as evolutionarily significant units, and sensitivity to anthropogenic disturbance)). Federal management for this species follows Region 6 Sensitive Species (SS) and/or OR/WA BLM Special Status Species (SSS) policies.

B. Scope

Address the scope of this strategy (e.g., geographic, temporal, and boundaries regarding information used to produce the strategy). State the limitations of current scientific knowledge. Describe how uncertainty is addressed in this strategy (e.g., role of synthesis, speculation, and inference). Identify the application and interpretation limits of this strategy and the limits in the data used to produce it.

(Example)

The geographic scope of this strategy includes consideration of the known and suspected range of the species, in (list area being included such as "the planning area of the Forest Service, Region 6, and/or Oregon and Washington BLM"). An emphasis of species-considerations is provided for federal lands in the planning area; however, species-knowledge compiled from federal lands outside the planning area and non-federal lands is included as it is relevant to the overall species' conservation. This strategy summarizes existing knowledge of a relatively little known vertebrate. A great deal of new information has been generated regarding this species in the last few years, especially with respect to distribution, habitat, and genetic structure, and information updates may be necessary to keep this strategy current with time. Also, threats named here summarize known or suspected existing threats, which also may change with time. Management areas identified apply to site-specific localities; however larger scale issues such as population connectivity and range-wide concerns are listed and also included in a description of management area selections. Uncertainty and inference are acknowledged where appropriate.

C. Management Status

Indicate the current Special Status/Sensitive designation by Region 6 or OR/WA BLM, federally listed or candidate species status under the Endangered Species Act, and any special State designations. Also include a reference to where updated species lists are maintained to alert the reader that management status may change over time. The NatureServe and Natural Heritage Program Global, National, State and subspecies (if applicable) ranks should be stated in the document, but refer readers to a website where updated information/status about this species may be found. If the species has status in any State Comprehensive Conservation plans, include that information. To the extent possible, summarize the history of the species status.

Briefly describe any existing regulatory mechanisms, management plans, and/or conservation agreements specific to this species. Focus on the geographic area where the plans/agreements are relevant and key management direction articulated by the plan/agreements. Also describe significant management guidance that has been published for this species, but isn't part of an organized management plan.

II. Classification and Description

A. Systematic and Synonymy

Summarize the current systematic status of the species from the family level to the species, variety, or subspecies. If the taxonomy for this species is rapidly changing, indicate the date of the knowledge being presented. List the current synonyms which might cause confusion with the species' current systematic status, but there is no need to list all historical usage.

Scientific names of all plants used in the document (unless directly quoting from a reference source) must follow the preferred nomenclature in the USDA Natural Resources Conservation Service's "PLANTS" database (**online at http://plants.usda.gov/index.html**). Taxonomic discussion should address commonly used synonyms or alternate nomenclature and those of primary local floras, if local usage differs from PLANTS. Indicate if the

phylogeny or taxonomy of the species suggests that it represents an especially unique element of the biota in Region 6 or OR/WA BLM.

Scientific names of all fauna species used in the document must follow the preferred nomenclature in the Integrated Taxonomic Information System (ITIS) at http://www.itis.usda.gov/. If local usage differs from ITIS, indicate if the taxonomy of the species suggests that it represents a unique element of the biota in Region 6 or Oregon/Washington BLM.

B. Species Description

Provide a technical and/or non-technical description of the species, and describe features that distinguish it from very similar taxa within Region 6 and OR/WA BLM. Briefly identify and describe any species that are similar in appearance or easily confused with the target species. If genetic information is relevant to the description of the species, include that information here. This section may include line drawings and photos if available, or refer the reader to published sources for technical descriptions of the taxa, plus photos, and technical line drawings. If several sources are available, indicate which are more complete, or otherwise more useful or readily available.

III. Biology and Ecology

Throughout this section, describe scientific understanding of the topic and indicate the level of confidence in any biological conclusions or interpretations (identify the level of scientific uncertainty). Indicate the degree of certainty based on the variety of factors that contribute to the strength of evidence (e.g., experiments vs. observations, multiple geographic sites vs. one site, author speculation vs. direct evidence). Some of the topics covered in this section may apply specifically to botanical species, while others pertain only to wildlife.

A. Life History

1) Life history and strategy (e.g., annual/perennial; “r” species with high reproductive rates, occurring in unstable and changing habitats versus “k” species with low reproduction rates, long life-spans, occurring in stable habitats). Include discussion of the role of disturbance processes in population and species dynamics (Pavlovic 1994; Grime 1979).

2) Plant reproduction: monecious/dioecious, self-compatible versus obligate out crossing, mating system, methods of vegetative reproduction or colonial growth if any, age of sexual maturity, etc.

3) Pollinators and pollination ecology, other reproductive mutualisms.

4) Seasons for plant reproduction, propagule dispersal/establishment, and germination site requirements (e.g., “safe site” conditions).

5) Fertility and seed/spore viability.

6) Dispersal mechanisms (seed/spore, vegetative), and sources of loss of seeds/spores such as insect predation or fungal decay.

7) Cryptic phases (e.g., seed bank dynamics and seed longevity, dormant stages).

8) Phenotypic plasticity, and the range over which such plasticity is expressed (e.g., are individual populations plastic or are there geographic patterns of plasticity?).

9) Mycorrhizal relationships.

10) Hybridization.

11) Discuss time periods in the species life cycle when they are most easily observable and identifiable (e.g., blooming or fruiting periods, surface activity periods, nesting or mating seasons, etc.).

12) Describe phenology and behavior of courtship and breeding.

13) Describe breeding behavior regarding site fidelity, alternate nest or den sites, and limitations that reproduction and/or rearing-site availability may place on breeding. Also describe any important breeding associates.

14) Describe brood size (geographic and temporal variation – provide brief overview but give details in "Demography" section).

15) Describe parental care, movements of young, and dispersal of offspring (e.g., does species require undisturbed reproduction and/or rearing sites).

16) Vital rates: recruitment, survival, age at which individuals become reproductive, lifespan, proportion of populations reproducing, etc.

(a) Life cycle diagram for generalized population.

(b) Analysis of demographic matrix (McDonald and Caswell 1993) that results from the generalized life cycle diagram. Include discussion of dominant life history stages as they relate to lambda from an elasticity analysis.

B. Activity Pattern and Movements

This topic specifically covers wildlife species.

Describe important patterns in:

1) Circadian, seasonal, circannual.

2) Broad-scale movement patterns (e.g., migration, nomadism).

3) Discussion of discontinuities in distribution and degree of isolation of populations. Review geographic variation in abundance at the regional extent.

(a) Sex and age differences in dispersal capabilities and patterns.

(b) Regional differences in migration and other broad-scale movement patterns.

(c) Identify potential links to, or isolation from, other segments of the populations and draw conclusions regarding connectivity.

C. Food Habits

This section is for wildlife species specifically.

1) Describe food habits, noting age specific differences in addition to geographic and temporal variation. Indicate relative value of diet items and the conditions that lead to variation in food value (e.g., abundance, habitat structure as it relates to foraging).

2) Indicate degree of flexibility in diet, and the role that diet and dynamics of food resources play in species behavior (such as nomadism, migration, and variation in productivity).

3) Where appropriate, briefly review the natural history of principle foods noting factors which influence food abundance, quality, distribution, and vulnerability. [This section can be dominated by citations to literature (such as Birds of North America Species Accounts).]

D. Range, Distribution, and Abundance

As possible, utilize maps to address the elements described below. Consider various mapping scales to show the entire range of the species, the range in Oregon and Washington, etc. For Oregon and Washington maps, include BLM District and Forest boundaries.

1) Describe current and historic range and distribution. To the extent possible, describe the geographic variation in abundance at the broad extent.

2) Address current and historic regional range and abundance.

(a) If possible include a map in the appendices. (This may, as well, be the location to refer to map appendices that are site specific and would not be included in an internet version of the conservation strategy). Disclose the source of the information (is there a site locality database?)

(b) State the range of the species within Region 6 and OR/WA BLM (e.g. found or suspected in several provinces, over more then 1 state; found or suspected in a few provinces, may be limited to one state; found or suspected in only 1 province or similar small area; found or suspected at 1 or a few very specialized locations such as springs or natural refugia). How well are known sites compiled? Is there a distinction between historic and extant known sites?

(c) Describe the historic range. The historic range can sometimes be derived from habitat associations, occupancy rates in suitable habitat, historic habitat distribution,

potential past disturbance regimes, and other knowledge about the species. Emphasize the strength of evidence used to determine this.

3) Discuss discontinuities in distribution and degree of isolation of populations. Review known occupancy and abundance patterns, and geographic variation in occupancy or abundance at the regional extent.

(a) Include a brief summary of the distribution of documented occurrences/sites within the suspected range of the species in Region 6 and OR/WA BLM area (e.g., widespread within the suspected range; found throughout the suspected range, but distribution of known sites spotty; limited locations scattered throughout the suspected range; limited locations confined to a small portion of the suspected range; or other). What is the spatial context of a "site"? What is the spatial context of a "population"?

(b) Biological distributions to consider: isolated sites; isolated site clusters; limited connectivity among multiple sites and/or clusters; multiple avenues of connectivity among sites and clusters; unknown; or other. Where biological distribution occurs as a mixed pattern, indicate all patterns that may apply.

(c) Abundance patterns at sites: patterns of relative abundances or densities across range

E. Population Trends

Describe population trends (local, regional, and range-wide population, including the temporal pattern of occurrences or abundance). Emphasize strength of evidence and information used to make any inference regarding trend. Describe the temporal pattern of occurrence/abundance for this species at the spatial extent of Region 6 and OR/WA BLM and smaller scales (for instance highly variable, cyclic, relatively constant).

F. Demography

1) Genetic characteristics and concerns (e.g., genetic issues for small populations, hybridization, inbreeding depression, out breeding depression).

(a) Have some populations become isolated and non-sustainable demographically (at risk of declining without immigration from other populations) or genetically (at risk of losing genetic diversity)?

(b) Are there ecologically or genetically distinct populations that are extirpated or isolated beyond natural levels of interaction with other populations?

(c) Have edge populations been lost, or are at the risk of being lost?

2) Review/describe any PVA (Population Viability Analysis) models from the literature.

3) Discuss ecological influences on survival and reproduction emphasizing life stages that predominate the life cycle graph and demographic analysis.

4) Spatial characteristics (e.g., sources and sinks, metapopulation dynamics) of population(s) in Region 6 and OR/WA BLM and relationship to broader species range. Indicate degree to which geographically separate groups of individuals are demographically linked and the resulting population structure.

5) Identify factors limiting population growth for specific populations or the species in general (e.g., food, breeding habitat, social interactions, predation, competition, habitat destruction or fragmentation, barriers to dispersal, etc.).

6) Note social pattern for spacing as this relates to demography (e.g., size of area defended, spacing of home ranges, defense of home range vs. breeding site, etc.). Does territoriality play a role in population regulation?

7) Patterns of dispersal of young and adults (this will overlap with earlier description but in this section will emphasize role in demographics).

G. Habitat

Describe the important physical and biological habitat characteristics for this species. Stress potential geographic variation within Region 6 and OR/WA BLM; include micro to broad scale if possible (e.g., breadth of habitat association). Consider the following:

1) Describe habitat associations, successional stages, and seasonal differences, if applicable.

2) Discuss habitat selection distinguishing between used, selected, preferred, and required habitat.

3) Separate macrohabitat and microhabitat descriptions into different sections (foraging, nesting, roosting, etc., if applicable).

4) Describe relevant features of microhabitat and macrohabitat such as soil/substrate, vegetation type, successional and structural information; highlight sensitivity of the habitat relationship (e.g., is the species restricted to a single soil type?).

5) Discuss landscape context issues such as cold air drainage, slope or aspect, influence of land mosaic, and the importance of the juxtaposition of habitats. Include home range information as it relates to broad-scale habitat use, stressing response to spatial patterns.

6) Describe geographic distribution of habitat and change in extent over time. Include a discussion of the cause of the change (e.g. species is restricted to riparian gravel bars, and changes caused by dams).

7) Describe habitat availability relative to known occupied habitat, and distinguish between availability of high quality habitat compared to more marginal habitat.

8) Describe the ability of the species to occupy/expand into new habitats/areas.

State the confidence in the knowledge of habitat association of species:

(a) High – Habitat association is well known from species-specific studies or surveys with habitat data, representing a good portion of the range of the species and allowing us to define specific habitat associations across the range or fairly well known from survey or study with some habitat information, representing more then 1 part, but not all of, the range of the species and allowing for some specificity of habitat association across the range.

(b) Moderate – General information is based on several locations and surveys, with limited habitat information and/or limited coverage of the range of the species, allowing for a general description of habitat association across the range.

(c) Low – Limited information is based on a few locations and surveys, with limited habitat information and/or limited coverage of the range of the species, allowing for a very general description of habitat association across the range of poorly known – few to only one known location – and little documented habitat information.

H. Ecological Considerations

Address community ecology, and consider native and introduced species interactions with this species.

1) Predators and relationship to habitat use (i.e., change in vulnerability as a result of habitat).

2) Competitors (e.g., breeding sites, food) and relationship to habitat use.

3) Parasites and disease.

4) Symbiotic and mutualistic interactions.

5) Employ an 'Envirogram' (Andrewartha and Birch 1984) to depict complex ecological relationships (see Hayward and Verner 1994 for examples). Discuss how habitat influences the interacting species.

6) Herbivores and relationship to habitat.

7) Discuss how habitat influences the interacting species showing dominant linkages between species and environment (e.g., linkage to hydrology for fen plants).

IV. Conservation

A. Threats to Species

List, describe, and prioritize the specific threats to the long-term conservation of this species globally and on Region 6 and OR/WA BLM lands. In particular, address the role that OR/WA BLM and Region 6 actions have, including any specifics regarding the scale or intensity of the threats. Consider whether OR/WA BLM and Region 6 actions have a significant influence on the species or habitats. Example activities to consider include:

1) How do management activities or natural disturbances (e.g., road building, timber harvest, livestock, non-motorized recreation, motorized recreation, restoration, blow down, wildfire, hazardous fuels reduction activities, or fire suppression) directly or indirectly influence habitat quality and availability for this species (e.g., fragmentation, degradation, hydrologic changes)?

2) How do management activities or natural disturbances directly or indirectly influence individuals or populations of this species?

3) Does this species interact strongly with any exotic species that currently occur in Region 6 or OR/WA BLM (e.g., weeds, introduced bio-control agents, introduced herbivores), and is management or lack of management of exotic species a threat to this species?

4) Does over utilization of the species for commercial, recreational, scientific or educational purposes threaten the conservation of the species?

5) Do existing landownership patterns relative to the species known range or habitat needs directly or indirectly influence the ability of federal land managers to provide for the conservation of the species?

6) Do concentrated vs. dispersed management activities or natural disturbances affect the species life history patterns differently? Are there management activities, lack of management, or natural disturbances within reserved areas that limit or reduce the effectiveness of reserves for the species?

7) If possible, consider adding an Appendix that identifies or lists site-specific threats (if known). Each site could be evaluated to assess known threats to the population.

B. Conservation Objective

Describe the objective/goal of the Strategy. Be as specific as possible. Include the desired measurable outcome for the species in terms of distribution, population numbers and sizes, habitat condition or other biological factors. Address goals for both the short and long term, as these may be different. Address goals at different spatial scales, if this clarifies Conservation Strategy approach.

1) Desired distribution may range from small, isolated populations to a nearly continuous population across the species' range, depending upon species-specific factors.

(a) Natural rates of local extinction, gaps and dispersal barriers, habitat patchiness,

disturbance, succession, and other ecological dynamics contribute to the desired distribution.

(b) See Appendix B for further information to consider.

2) Address, where applicable, the distribution of suitable habitat necessary to support the conservation of the species.

3) Population numbers and sizes may be described qualitatively or quantitatively, but should address sustainability of isolated populations, if needed to meet the objective.

4) Conservation objectives and/or management and risk levels may be different in the short-term versus long-term due to known or suspected current concerns for a species. Consider seral stage emphasis in various land allocations, and what the landscape of the future may look like, as management under Land and Resource Management Plan Standards and Guidelines play out.

5) Clarify underlying assumptions and definitions, as needed. For example, if "well-distributed" populations or sites are sought, explain what that spatial distribution entails and how it differs from the current or reference distribution. If sites in "optimal" conditions are preferred for management for long-term persistence, clarify the difference between optimal and suitable habitat. What risk level does the strategy have? Some of these assumptions can/should be reiterated in later sections.

C. Selection of Management Areas

Specific sites or populations may require management in order to meet the conservation objective. Management Areas are those locations on the landscape where species management is determined to be necessary to meet the objective. These Areas may be of varying sizes and degrees of active management associated with them, depending on the local need for the species. Consider and address the following:

1) Assumptions

Applicable Land and Resource Management Plans serve as the foundation for any conservation planning effort, and in many cases may adequately provide for species conservation. Many of the land allocations and Standards and Guidelines associated with the Plans benefit the species to some degree. The Plans provide the basis in which to assess the need for additional management actions and Areas for the species, and are useful in determining the distribution of the Areas.

(a) Describe the assumptions about the effects of ongoing and potential management actions in each land allocation (matrix, riparian reserve, late-successional reserve, etc.) within the range of the species, and the effectiveness of these allocations in providing for the conservation of the species.

(b) If other Plans, Agreements, or Strategies are in place for this species, describe the assumptions these have upon this species' conservation.

2) Distribution, Connectivity, and Landscape Considerations
Management Area placement may be based on analyses of suitable habitat (for instance, amount of suitable habitat in reserves) or the need for connectivity of habitat/populations. In some cases, management of unoccupied or unknown occupancy habitat may be recommended to provide for species conservation.

(a) Describe assumptions about potential occupancy in different habitat types, both now and projected into the future.

(b) Include an assessment of the contribution to the conservation objective made by unsurveyed habitat in reserves or other land allocations favorable to the species.

3) Intermediate Management Scales
Intermediate scales consist of Management Areas that are clustered into biologically relevant populations or multi-species assemblages. Intermediate scales can be highly variable between taxa, since this scale is determined by biological factors like habitat specificity and dispersal ability. The Strategy may need management at an intermediate scale to meet conservation objectives.

Address the following to determine whether intermediate management scales are needed for the species. Where possible, describe management and conservation objectives for the intermediate scales.

(a) Clustering of species locations into local populations, each cluster managed under different objectives;

(b) Clustering sites to identify "core areas/source habitats" or "connectivity areas"

(1) Identification of watersheds or other delineated areas, due to conditions in neighboring watersheds necessitating connectivity or population sustainability;

(2) Based on biological criteria (e.g., discrete populations), management (e.g., land allocation patterns), or risk factors (e.g., wildfire probabilities) populations covering multiple watersheds may warrant different levels of management.

4) Management Area Selection Criteria
Criteria for the selection of Management Areas flows from the conservation objective, assumptions about the contribution of different land allocations, and connectivity considerations. Selection of specific Management Areas are likely to depend on a wide range of both broad and local scale (e.g. habitat "quality" at the site) factors.

(a) Describe/outline the broad scale factors used in selecting Management Areas:

(1) Amount of habitat in reserves or land allocations favorable to the species in the vicinity (e.g. watershed)

(2) Role of sites/habitat in broader connectivity patterns

(3) Role of sites/habitat in maintaining genetically important populations (e.g. isolated populations, populations at the edge of the range)

(4) Role of sites/habitat in maintaining distances between sites/habitat within the natural range of variability

(b) Describe local-scale factors used:

(1) Measures of habitat quality and population size at sites

(2) Stability of sites/habitat (e.g. wildfire risk)

(3) Management needs at sites/habitat (e.g. wildland-urban interface, research area)

(4) Trade-offs or conflicts with the existing land use

(5) Opportunities for connecting or overlaying protected areas for other species (other sensitive, threatened or endangered, etc.)

5) Specific Management Area Selections

Conservation Strategies may identify particular sites/habitat as Management Areas, or may define criteria for field level selection of sites/habitat. Clearly describe whether this Strategy defines the specific sites needed for management; or if the local land management units are to use the above (or additional) criteria for site selection. Describe expected size of the areas, and any variation that may be needed.

(a) If the Strategy defines where specific Management Areas are located, clearly document the areas, both with a written description and with a map. The map should be as specific as possible, clearly delineating boundaries of each Management Area.

(b) If field units are to identify specific Management Areas, describe clearly the size of the Areas, the expected variation in size, and the general desired distribution.

(c) Describe any flexibility available in refining the selection of Management Areas. Describe how and when selected Management Areas may change through time, both in size and spatial location on the landscape. Take into account seral stage succession and how management plays out under specific Land and Resource Management Plans. Management Areas may be significantly different in location and size in the short term and long term.

(d) Identify specific intermediate scales for management: clusters of sites, watersheds, or other appropriate delineations where certain management is emphasized or required. Clearly document the areas, both verbally and with a map. Be as specific as possible. If field units are to identify the specific delineation of the intermediate scale, describe clearly any desired attributes.

6) Surveys, Incidental Detections

(a) Identify, both in written and graphic form, locations where inventory or project surveys would be beneficial and/or provide flexibility in Management Area selection.

(1) Surveys may address key information gaps, including gaps in distribution or help establish a distributional reference condition.

(2) Surveys may be needed to verify occupation in reserves (or other land bases where species management is emphasized), or to identify optimal habitat for conservation.

(b) Describe guidelines for newly discovered sites – if they are to be managed, and whether they should follow the requirements described below. Newly discovered sites may also be able to substitute for previously managed sites.

7) Other Conservation Opportunities

Consider and describe the need for Conservation Agreements, partnerships, or proposed land exchanges for maintenance or restoration of critically needed habitat for species.

D. Management Area Requirements

Management actions within the Management Areas should reduce or eliminate the Threats previously described for the species, and should be supportable based on literature, research, or in some cases, anecdotal information. Management Area requirements are those actions that should/could be undertaken within the Management Area.

Management Area requirements may be:

- site-specific (each site has specific management actions to be undertaken that may vary by Management Area),
- general (each site follows the same specific management actions) or
- very generic (goals and objectives are described for site management, and then on the ground site-specific management is then determined by the local managers).

In this section:

1) Describe specific management actions to undertake or allow within the Management Areas. As described above, this may be very site specific, general, or very generic.

2) Define any management requirements at the intermediate scale. Again these requirements may be site-specific, general, or very generic.

Some of the following factors may play important roles in determining management needed at the intermediate scale:

(a) Riparian reserves as corridors/connective habitat

(b) Size and shape of blocks of contiguous habitat

(c) Adjacency of habitat blocks to large reserves

(d) Species' dispersal ability across different habitat types

(e) Geographic structure of populations and metapopulations

V. Research, Inventory and Monitoring Opportunities

Identify and prioritize information gaps that, if filled, would help in providing for the conservation of the species. These are not required actions.

Identify avenues/mechanisms for gathering information to fill the gaps identified in the previous section. Be sure to prioritize and identify the most efficient mechanism for acquiring the information, addressing research, inventory, or monitoring opportunities.

In addition to filling the data and information gaps identified above, describe research, inventory, or monitoring objectives and designs that will provide reasonable power to detect important changes in population response to management activities. In particular examine the constraints that species biology, life history, distribution, and behavior place on monitoring. The following are items to consider including in this section:

1) Species inventory - Critically examine existing methods of distribution surveys. Identify strengths and weaknesses, and suggest important elements to include in an inventory.

2) Habitat inventory - Critically examine existing methods of habitat surveys. Identify strengths and weaknesses, and suggest important elements to include in an inventory.

3) Population monitoring - To the extent possible identify: the appropriate geographic and temporal scales, the best indicators of population change (e.g., breeding population vs. adult survival), timing in relation to courtship and breeding, and the 'detection' or survey system that would be used in monitoring.

(a) Establish objectives.

(b) Critically examine monitoring methods. Identify strengths and weaknesses, and suggest important elements to include.

(c) Consider presence/absence monitoring of local population persistence, local population trend, and regional trend.

4) Habitat monitoring - Review approaches to habitat monitoring. Identify the geographic and temporal scales appropriate to monitor habitat.

5) Seed banking - Are seed or other germ plasm storage programs in place for this species (e.g. involvement of the Center for Plant Conservation)?

6) Effectiveness monitoring – Critically examine methods of assessing the effectiveness of various approaches to species site management. Identify strengths and weaknesses and suggest important elements to include.

7) Research- As necessary, document additional information needs on habitat associations, or validation of habitat models.

VI. Adaptive Management

Describe the expected lifespan of the conservation strategy – when it should be revised to reflect new information, and what types of new information, including research, would act as triggers for revision. Conduct a periodic literature review to determine if new information on the species is available, and determine need for Strategy revision.

Definitions of Terms Used (Glossary)

In this section, list and define the terms used in the Conservation Strategy. (See Appendix A to this format, which lists some more common terms, and the standardized definitions to be included/used in the Conservation Strategy. Appendix A also lists terms that the Conservation Strategy authors will need to create their own definition of, if they use that term).

Acknowledgments

The authors may or may not want to acknowledge the assistance or work of specific individuals, agencies, or groups.

References

This should include all of the references for the Conservation Strategy.

Appendices

If needed.

References

The following are the references in this Draft Conservation Strategy format.

Andrewartha, H. G., and L. C. Birch. 1984. The ecological web: more on the distribution and abundance of animals. University of Chicago Press, Chicago, IL, USA

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McDonald, D. B., and H. Caswell. 1993. Matrix methods for avian demography. Pages 139-185. In: D. Power, ed. Current Ornithology, Volume 10. Plenum Press, New York, NY, USA.

Pavlovic, N. B. 1994. Disturbance-dependent persistence of rare plants: anthropogenic impacts and restoration implications. Pages 159-193. In: M. L. Bowles and C. J. Whelan. Eds. Restoration of endangered species: conceptual issues, planning and implementation. Cambridge University Press. Cambridge, NY, USA

USDA Forest Service & USDI Bureau of Land Management. 1994a. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Portland, OR.

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APPENDIX A

TERMS
To be used in the development and writing of Conservation Strategies

To help standardize terminology used in the writing of Conservation Strategies, the following identifies common terminology to be used and establishes a consistent definition for the word. If these terms are used in the Conservation Strategies, then the term and the definition included here should be included in the "Definition of Terms Used (Glossary)" section of the Conservation Strategy.

Barrier

Anything that holds apart, separates, hinders movement, or could prevent the mixing of individuals of the same species. A consideration of time should be taken into account in the context of the barriers potential effects to genetic drift or isolation. (see also connectivity)

Communities at risk

A group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) within or adjacent to federal land (Healthy Forests Restoration Act of 2003).

Condition class

The general deviation of ecosystems from their pre-settlement natural fire regime can be viewed as a measure of sensitivity to fire damage to key elements and processes typical of those ecosystems, or fire-related risk to ecosystem health. Classes are assigned based on current vegetation type and structure, an understanding of its pre-settlement fire regime, and current conditions regarding expected fire frequency and potential fire behavior. Condition Classes are defined as the relative risk of losing key components that define an ecosystem (Hardy et al., 2001).

Connectivity

The linkage of similar but separated suitable habitat patches, by corridors or "stepping stones" of like habitat that permits interaction between individuals or populations over time. Connectivity must consider time in the context of its potential effects to genetic drift or isolation. (see also barrier)

Documented Occurrence

Generically, it is the location of an individual of a species. Multiple occurrences may equal a site. Refer to the ISMS definition for the taxa, if available (or updated definitions from GeoBOB, the new OR/WA BLM database). If this definition is not available, this should be defined within the conservation planning document. When used in context of Special Status/Sensitive Species lists, a physical record exists to indicate that the species either occurred historically or currently exists in the area defined.

Fire regime

Fire Regime I: an area in which historically there have been low-severity fires with a frequency of 0 through 35 years; and that is located primarily in low elevation forests of pine, oak, or pinyon juniper.

Fire Regime II: an area in which historically there are stand replacement severity fires with a frequency of 0 through 35 years; and that is located primarily in low- to mid-elevation rangeland, grassland, or shrubland.

Fire Regime III: an area in which historically there are mixed severity fires with a frequency of 35 through 100 years; and that is located primarily in forests of mixed conifer, dry Douglas fir, or wet Ponderosa pine. (Healthy Forests Restoration Act of 2003)

Fragmentation

The loss, division, or isolation of patches of similar habitats at a scale relevant for the species being addressed.

GeoBOB (Geographic Biotic Observations Database)

An upgraded version of the ISMS database developed in 2004 but used solely by OR/WA BLM (and NWFP CA BLM), designed to store existing Survey and Manage data as well as BLM Special Status/Sensitive Species data. GeoBOB will hold spatial representations of species observations and survey effort using ArcGIS, ArcSDE, and Oracle technologies**.**

Habitat disturbance

Natural or human caused disturbances that likely may have impacts on the species habitat, its life cycle, microclimate, or life support requirements.

ISMS database (Interagency Species Management System)

An interagency database containing information about FS and BLM Survey and Manage species, in the Northwest Forest Plan area. ISMS includes; data for surveys, species locations, and their associated habitats/environmental conditions. This database is now defunct, replaced by GeoBOB for BLM and NRIS for Forest Service.

Management Areas

Locations on the landscape where sites, populations, or habitat are managed to provide for the conservation of the species.

Monitoring

The collection of information used to determine if management actions are meeting objectives of standards and guidelines and if they comply with laws and management policy. Monitoring is used to determine if standards and guidelines are being followed (implementation monitoring), if they are achieving the desired results (effectiveness monitoring), and if underlying assumptions are sound (validation monitoring). Monitoring usually collects information on a sampling basis, provides standardized data, and occurs at multiple levels and scales.

NRIS (Natural Resource Information System)

A set of standard corporate databases and computer applications used by the Forest Service nation-wide to record basic natural resource data. NRIS Fauna and NRIS TES Plants will be the primary repositories for Forest Service Sensitive Species information.

Peripheral populations

Sites which define the outer edges of the species established range. Sites on the periphery of the range may have genetic differences from the rest of the species range that may provide additional genetic diversity for the species.

Persistence

The likelihood that a species will continue to exist, or occur, within a geographic area of interest over a defined period of time. Includes the concept that the species is a functioning member of the ecological community of the area.

Range

The limits of the geographic distribution of a species.

Reserved Land Allocations

A geographic area identified in land and/or resource management plans managed for particular values, including biological-ecological integrity and species persistence. Inclusive of no-entry areas and areas with entry and management for specified objectives. Reserved land allocations include but are not limited to Late Successional Reserves, Riparian Reserves, Congressionally Withdrawn, etc.

Site (Occupied)

The location where an individual or population of the target species (taxonomic entity) was located, observed, or presumed to exist and represents individual detections, reproductive sites, or local populations. Specific definitions and dimensions may differ depending on the species in question and may be the area (polygon) described by connecting nearby or functionally contiguous detections in the same geographic location. This term also refers to those located in the future. (USDA, USDI 1994) Other terms such as known site, species location, and element occurrence are included in this definition.

Suitable habitat

Abiotic and biotic environmental conditions within which an organism is known to carry out all life history aspects.

Viability

Ability of a wildlife or plant population to maintain sufficient size to persist over time in spite of normal fluctuation in numbers; usually expressed as a probability of maintaining a specified population for a specified period. (USDA, USDI 1994)

Viable populations

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 1994). For invertebrate, non-vascular plant and fungi species "appropriately distributed" may include; the species is well-distributed, the species is distributed with gaps or the species is restricted to refugia. Refer to page 123 in Chapter 3 and 4 of the FSEIS for the Northwest Forest Plan for further clarification.

Well-distributed

Distribution of the species is sufficient to permit normal biological function and species interactions. This distribution considers life history characteristics of the species and the habitats for which it is specifically adapted.

Wildland Urban Interface

An area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or in the case of any area for which a community wildfire protection plan is not in effect an area extending 1/2-mile from the boundary of an at-risk community or an area within 11⁄2 miles of the boundary of an at-risk community, including any land that has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community. (Healthy Forests Restoration Act of 2003).

SPECIFIC TERMS
To be defined by the Conservation Strategy author

These terms, if used in a Conservation Assessment or Strategy, need to be defined within the text of the individual document (and in the Definition of Terms Used section), to provide clarity to the reader concerning the use of the word relevant to the species, habitat, or other life requisite needs.

Adjacent area
Corridor
Element occurrence: This term should be used only for describing information from the Heritage Program. When using in the document, refer to the Heritage Program definition for the species.
ESU (Ecologically Significant Unit)
Gap
Late-seral associate: Define the specific characteristics of late-seral vegetation that a species is associated with (i.e., decay class 3 downed logs in stands over 80 years of age, with high canopy closure, etc.)**.**
Legacy: (see comment for late-seral associate)
Limited disturbance area: Define the specific characteristics you want or need to manage the site.
Microsite: If used, define specific requirements needed.
Microclimate: If used, define specific requirements needed.
No disturbance area: this term may be used to define site management guidance, and the characteristics/provisions needed to meet species life requirements.
Population centers
Purposive Surveys: A type of strategic survey. It is a focused search conducted in areas where the target species is expected to occur.
Reference sites
Seasonal restriction

References

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USDA Forest Service and USDI Bureau of Land Management. 1994. 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.

APPENDIX B

ADDITIONAL INFORMATION
Describing the Conservation Objective

For vertebrate and vascular plant species, the conservation objective is typically well-distributed populations, but may include some gaps in the distribution when those gaps are already present. For non-vertebrate, non-vascular plant, and fungi species, the objective may be distributions of populations with significant gaps or even restricted to isolated refugia for part or all of the species range

The 1994 Northwest Forest Plan (NWFP) decision may also provide some guidance on describing objectives. Although the NWFP only addressed westside FS and BLM lands, some of the information and approaches used may be helpful for species conservation outside of the NWFP area as well. For instance, an evaluation was conducted for each late-successional/old-growth associated species to determine the likely persistence outcome for each of the land management alternatives addressed in the draft Plan. Four distinct outcomes were identified (A-D below), with a ranking or percentage likelihood of that outcome determined for each alternative. Those four potential outcomes are:

A- Habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize, well distributed across federal lands. (Note that a determination of "well-distributed" must be based on knowledge of the species' distribution, range, and life history).
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 cause some limitation in interactions among local populations. (Note that the significance of the gaps must be judged relative to the species distribution, range, and life history, and the concept of metapopulations).
C- Habitat only allows continued species existence in refugia, with strong limitations on interactions among local populations.
D- Habitat conditions result in species extirpation from federal land

From the FEMAT report it was stated: "In focusing on the attainment of 80 percent likelihood of achieving Outcome A, we are not suggesting that only options attaining that likelihood satisfy the viability regulation (FS policy requirement). We think it likely that options attaining such a percentage would be viewed as meeting the requirement, but a score of less than 80 should not automatically be regarded as a failing grade. Similarly, in some instances it may be appropriate to look at categories A and B (that is, A plus B) as the benchmark. Indeed, in situations where a species is already restricted to refugia, it may be appropriate to look at A plus B plus C" (USDA & USDI 1994b, p. 3&4-123).

The 1994 decision states that "compliance with the [viability] regulation is not subject to precise numerical interpretation and cannot be fixed at any one single threshold" (USDA & USDI 1994a, p. 44). In the context of vertebrate species, the decision also stated that "The

gaps that may exist in the historic distributions of species under our decision do not preclude a finding of compliance with the fish and wildlife resource regulation, especially because most such gaps are already present. Distribution cannot be evaluated on a monolithic scale for all species" (USDA & USDI 1994a, p. 47).

Several potential limitations to management should be considered in establishing the conservation objective for a species. For example, if a species is confined to isolated refugia (outcome C) because of an irreversible loss of suitable habitat, it would not be practical for a Conservation Strategy to establish outcome B or A as the objective for the species. In this case the appropriate objective may be to maintain stable populations in the refugia where the species is currently found. Other potential limitations may include:

- Irreversible or irretrievable loss of populations or habitat between historic and current conditions
- Lack of basic knowledge about the species (e.g. habitat association, response to management, dispersal)
- Survey impracticality (e.g. detectability, taxonomic identification)
- Disturbance or other factors beyond the control of management (e.g. wildfire)
- Ability of management to maintain populations (e.g. in marginal habitats)

These factors may vary across a species range, and an objective may include different outcomes for different portions of a species' range.

For many taxa, information is extremely limited on ecological, demographic, or genetic factors, and it may be impossible to detect any of the consequences of gaps in distribution. In these situations, the conservation objective could default to maintaining populations of the species across the species' range at an appropriate spatial scale. For instance, the objective may be to maintain a population of the species in every watershed (fifth-field, for instance) or administrative unit in which it occurs. The choice of this spatial scale should rely on basic biological knowledge about the species.