United States
Department of
Agriculture

Forest
Service

October 2014

Environmental Assessment

Designation of the Many Lakes Research Natural Area

Deschutes National Forest Service
Bend/Ft. Rock Ranger District
Deschutes County, Oregon

Township 20 South, Range 7 East, Sections 11, 12, 13, 14

Responsible Official: James M. Peña
Regional Forester
Pacific Northwest Region

For more Information: Robin Vora, RNA Program Manager
rvora@fs.fed.us
Phone: (541)383-5766

Table of Contents

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION **4**

INTRODUCTION AND PLANNING AREA DESCRIPTION 4
PURPOSE OF AND NEED FOR ACTION 5
PROPOSED ACTION 5
DECISION FRAMEWORK 5
PUBLIC INVOLVEMENT 6

CHAPTER 2: ALTERNATIVES **8**

NO ACTION 8
PROPOSED ACTION 8
COMPARISON OF THE ALTERNATIVES 11

CHAPTER 3: ENVIRONMENTAL CONSEQUENCES **12**

MANAGEMENT ALLOCATIONS 12
THREATENED, ENDANGERED, AND SENSITIVE FISH SPECIES 12
THREATENED, ENDANGERED, AND SENSITIVE PLANT SPECIES 14
THREATENED, ENDANGERED, AND SENSITIVE WILDLIFE 15
NORTHERN SPOTTED OWL, FEDERAL THREATENED, MIS 16
WILDLIFE OTHER THAN THREATENED, ENDANGERED, AND SENSITIVE 29
CULTURAL RESOURCES 36
RECREATION AND ACCESS 36
INVASIVE PLANTS 36
OTHER REQUIRED DISCLOSURES 37

CHAPTER 4: AGENCIES AND PERSONS CONSULTED **38**

U.S. FISH AND WILDLIFE SERVICE 38
STATE HISTORIC PRESERVATION OFFICER 38
INDIVIDUALS, AGENCIES, AND ORGANIZATIONS 38

REFERENCES **40**

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 759-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

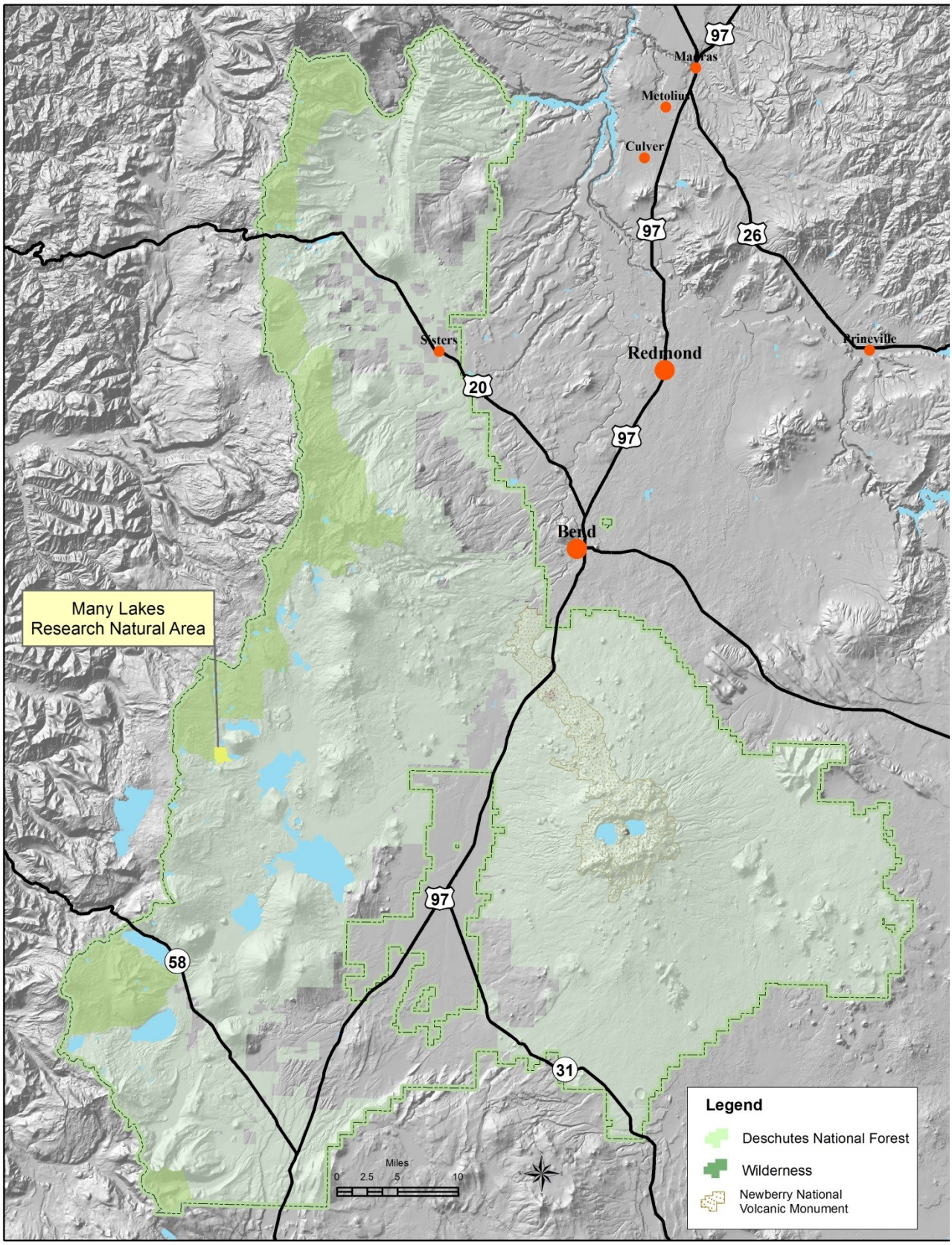

Figure 1: Vicinity of the Project Area

Chapter 1: Purpose of and Need for Action

Introduction and Planning Area Description

This environmental assessment evaluates the proposal formally establish the Many Lakes Research Natural Area (RNA). The proposed Many Lakes RNA is identified in the 1990 Deschutes National Forest Land and Resource Management Plan (LRMP) (USDA Forest Service 1990a) and is described in Appendix E of the 1990 Final Environmental Impact Statement (FEIS) for the LRMP (USDA Forest Service 1990b). The proposed RNA is within and completely surrounded by National Forest System lands. Establishment and designation involves: 1) completion of an environmental assessment to approve the candidate RNA with final boundaries and 2) amendment or adoption of existing LRMP Standards and Guidelines to guide management.

The system of RNAs was established with the goal of allowing natural processes to dominate. RNAs preserve natural features and plant communities for research and educational purposes. The objectives of RNAs are:

- to provide baseline areas against which the effects of human activities in similar environments can be measured;
- to provide sites for study of natural processes in undisturbed ecosystems;
- to provide gene pool preserves for plant and animal species. (Franklin et al. 1972).

The Many Lakes RNA is located in the Deschutes National Forest on the Bend-Fort Rock Ranger District approximately 18 miles southeast of Bend, Oregon and 6 miles north of East Lake (Figure 1 and Figure 2). It is located in the East Cascades Ecoregion, Pumice Plateau Forest subregion of Oregon (Oregon Natural Heritage Program 2003).

Research Natural Areas are part of a national network of ecological areas designated for research, monitoring, education, and to maintain biological diversity (USDA Forest Service manual 4063). For more information on the research arm of the Forest Service, visit www.fs.fed.us/research.

RNA needs in the Pacific Northwest were originally identified by Pacific Northwest Research Station scientists in the 1960s and early 1970s following national agency direction (Dyrness et al. 1975). Extensive surveys for RNAs were conducted in Central Oregon by Deschutes National Forest Ecologist Dr. Bill Hopkins and other staff in the 1970s and 1980s and recommendations were further evaluated by Sarah Greene of the PNW Research Station. Public involvement in the selection of the candidate RNAs occurred during the preparation and approval of the Deschutes LRMP in the late 1980s (USDA Forest Service 1990a). The Many Lakes RNA was identified in the 1990 Deschutes LRMP as a "proposed" RNA based on the unique nature of the area, and recognition that designation of this area as a research natural area would make an important contribution to the Natural Heritage network. A draft Establishment Record (ER) has been prepared providing specific background, justification, objectives, and management prescriptions per USDA Forest Service manual 4063.41 (USDA Forest Service 2010). The ER will be finalized concurrent with the NEPA process. The conversion from candidate to established RNA is accomplished by amending the Deschutes National Forest LRMP through a Decision Notice and Designation Order.

Purpose of and Need for Action

The purpose of establishing the RNA in the Many Lakes area is to contribute to a series of RNAs designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance." 36 CFR 251.23

The Many Lakes RNA would fill a need for representation of the following natural heritage elements identified in the 2003 Oregon Natural Heritage Plan (Oregon Natural Heritage Program 2003):

- montane lake with aquatic beds and marshy shore
- subalpine pond with aquatic beds and marshy shore
- few-flowered spikerush/brown moss fen with Engelmann spruce and lodgepole pine
- spring fen on seepage slope (including marsh marigold, shooting star, bistort, arrowleaf groundsel and false hellebore)
- Geyer willow shrub swamp
- bog birch shrub swamp
- bog blueberry shrub swamp with Engelmann spruce, lodgepole pine and tufted hairgrass
- Oregon spotted frog (Federal Candidate for listing as Threatened or Endangered)
- American scheuchzeria (Forest Service Sensitive Species)

Many Lakes RNA also provides cell representation for Northern spotted owl (Federally Listed Threatened), Pacific fisher (Federal Candidate for listing), California wolverine (Federal Species of Concern, Forest Service Sensitive), lesser bladderwort (Forest Service Sensitive), Blandow's feather moss, (Forest Service Sensitive) and tomentypnum moss (Forest Service Sensitive).

There is a need to modify the boundaries of the proposed RNA to provide a boundary that can be better described and recognized, and to provide for the ability to conduct roadside management activities such as hazard tree removal.

Proposed Action

The proposed action is to formally establish the Many Lakes RNA, to revise the boundary of the RNA, and to manage it according to the direction provided in the Deschutes LRMP (LRMP 4-92 to 4-93). Formal designation of the RNA by the Regional Forester would amend the Deschutes LRMP pursuant to 36 CFR 219.4 (1982 planning regulations).

The proposed RNA would be designated Management Area 2 (MA-2). The proposed RNA is presently being managed in accordance with this allocation's direction so designation would not impact other programs or activities. Specifics are given in Chapter 2.

Decision Framework

The Regional Forester for the Pacific Northwest Region of the USDA Forest Service is the responsible official for this project. The responsible official will review the environmental assessment and the entire project record and will decide whether or not to select the proposed action. In making the decision, the responsible official will take into consideration the specific objective of providing for research and educational opportunities, as well as preserving the unique ecological characteristics that are representative of the area.

The final decision will be to either:

- Amend the Deschutes LRMP to establish the RNA in the Many Lakes area (Proposed Action), or
- Decline to establish the area as an RNA, resulting in removal of Many Lakes as a proposed RNA from the Forest Plan during the next Forest Plan revision, or
- Conclude that significant impacts would result from the proposed action which would warrant the preparation of an environmental impact statement.

Public Involvement

Public participation in this project began when a scoping letter and map were mailed to members of the public and to Tribal governments on March 12, 2009. The project also appeared in the Deschutes National Forest Schedule of Projects starting in March 2009 and has appeared quarterly since this initiation. An article "Forest Service Proposes Four Areas of Study" was also published in *The Bulletin* (Bend, Oregon) newspaper on March 22, 2009. The project appears on the Deschutes National Forest's project web page as well: http://data.ecosystem-management.org/nepaweb/project_list.php?forest=110601.

Two telephone calls were received. Both commenters were supportive of the proposed action. The Proposed Action is not highly controversial as evidenced by the number and tone of the responses received from the public during the scoping phase of the process.

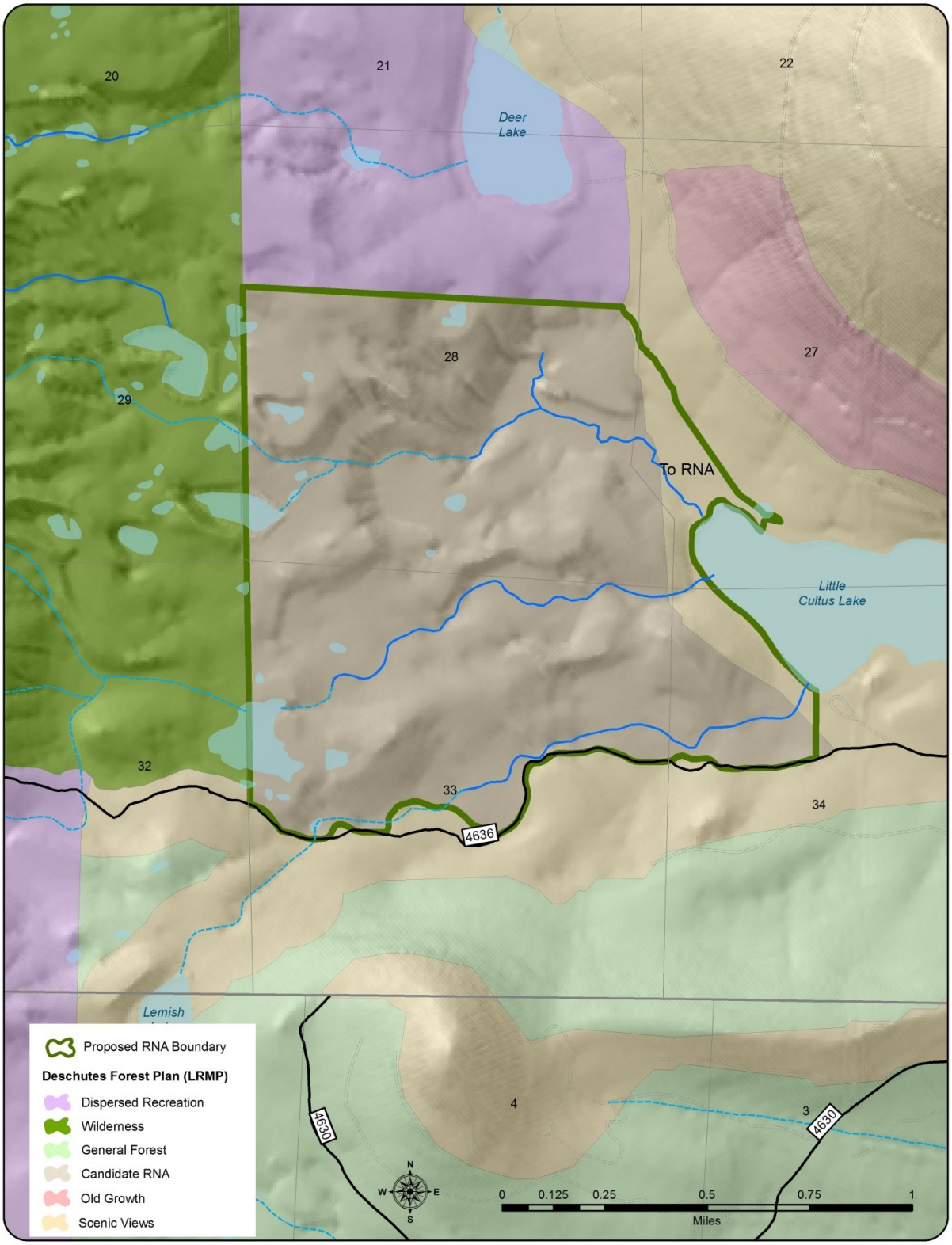

Figure 2: Map displays Deschutes LRMP allocations, including candidate RNA boundary and the proposed boundary for the Many Lakes Research Natural Area. Where proposed RNA boundary extends beyond candidate RNA area, the management allocation would move from Scenic Views to RNA.

Chapter 2: Alternatives

No unresolved conflicts concerning alternative uses of available resources were identified during the scoping process. Therefore, no additional alternatives were developed beyond the No Action and Proposed Action.

No Action

Under the No Action alternative, the candidate area would continue to be managed as a proposed RNA as directed in the Deschutes National Forest LRMP. The boundary of the proposed RNA, which encompasses approximately 315 acres, would not be modified. All current management direction of the Deschutes LRMP Management Area 2 would continue to apply until the LRMP is revised which is expected to occur within the next five to ten years.

Proposed Action

The proposed action would establish approximately 907 acres on the Deschutes National Forest as the Many Lakes RNA.

Boundary

The Proposed Action would modify the RNA boundary from what is shown in the 1990 LRMP to one that can be better described and identified. The boundary would follow the western shoreline of Little Cultus Lake and parallel a portion of the Deer Lake Trail along the northeastern edge of the RNA (Figure 2).

The new boundary would include the entire wetland/fen complex northwest of Little Cultus Lake, rather than bisect it. The proposed boundary change would include a portion of the west shoreline of Little Cultus Lake not used by recreationists. The boundary would be at least 250 feet from the nearest Little Cultus Lake campsite and would be at least 100 feet west-southwest of the Deer Lake Tail. The proposed expansion would result in 157 acres of Management Area 9 Scenic Views becoming MA-2. The RNA also lies within the Waldo Inventoried Roadless Area (IRA), and within a Late Successional Reserve (LSR).

Management Direction

The RNA would be managed as MA-2 in the 1990 Deschutes LRMP (LRMP 4-92 to 4-93). There would be no change from the existing standards and guidelines as listed here:

Standards and Guidelines in Deschutes LRMP adopted for the Wechee Butte RNA:

Recreation

M2-1: No physical improvements for recreation purposes such as campgrounds or buildings will be permitted.

M2-1: Picnicking, camping, collecting plants, gathering cones and herbs, picking berries, and other public uses will be allowed, though not encouraged, as long as they do not modify the area to the extent that such uses threaten impairment of research or educational values.

M2-3: The area will be closed to all off-highway motorized vehicle use if use of these vehicles

threatens natural conditions.[1]

Timber

M2-4: Timber harvest is not allowed in an RNA. No control of insect or disease should be instituted (see M2-22).

M2-5: Firewood cutting is not permitted.

M2-6: Timber harvesting will not be allowed in catastrophic situations.

Range

M2-7: Grazing is only allowed when authorized to preserve some representation of the vegetation for which the RNA was created.

M2-8: Where RNAs are located adjacent to or within grazing allotments, the boundaries will be marked and physical barriers constructed around the area to prohibit livestock entry if needed. [Note: there are no grazing allotments within or near the proposed RNA].

M2-9: Vegetation manipulation will not be allowed in catastrophic situations.

Wildlife

M2-10: Management practices may be authorized to control excessive non-game animal populations and only in cases where these populations threaten the preservation of some representation of vegetation for which the RNA was originally created.

Minerals

M2-11: Areas are to be withdrawn for mineral entry for mining claims.

M2-12: Geothermal leases will be issued with No Surface occupancy Stipulations. Leases must be approved by the Experiment Station Director.

M2-13: Pits and quarries will require approval of the Research Station Director and the Forest Supervisor.

Visual

M2-14: Management activities and research facilities should meet the visual quality level on the Visual Quality Objective Map. [Note: the Visual Quality Objective Map shows a visual quality level of Partial Retention].

Transportation

M2-15: No new roads or trails will be permitted within these areas, except those considered essential to research, protection, or educational uses.

M2-16: Any transportation facilities such as roads and trails provided for in this MA will have minimum impacts on the area ecosystems and must be located and managed to best fulfill the area's management objectives. Management of the transportation facilities could include closing facilities to all but the designated research personnel. Helispots and special uses such as telephone lines are not allowed.

---

[1] Travel management regulations have since prohibited off-highway motorized vehicle use except on designated routes or areas. No such routes or areas exist in the RNA.

Wildfire

M2-17: Unless plans approved by the Station Director provide for letting natural fires burn, aggressive containment using low impact methods should be used. High impact methods will be used only to prevent a total loss of the RNA. Mop up should be minimized with natural burnout being the preferred method.

Prescribed Fire

M2-18: Prescribed fire will be used only as specified in approved RNA management goals.

Fuel Loading

M2-19: Fuels will be allowed to accumulate at natural rates.

Special Uses

M2-20: Special uses will be allowed if they support the management objectives of the area and are approved by the Research Station Director and the Forest Supervisor.

Forest Health

M2-21: Monitor the area to detect pest problems which could destroy the RNA or cause damage to adjacent lands. Reintroduction of fire should be considered to reduce possible insect epidemic conditions.

M2-22: Action should be taken when the damage has the potential to modify ecological processes to the point that the area has little value for observation and research.

M2-23: Follow Forest-wide standards/guidelines for forest health.

Northwest Forest Plan

The proposed Many Lakes RNA area falls within the Cultus Mountain Late Successional Reserve (LSR). An LSR Assessment was completed in 1996 (USDA Forest Service 1996). The LSR Assessment recommends no active management for the Many Lakes RNA.

Inventoried Roadless Area

The proposed Many Lakes RNA is within the Waldo Inventoried Roadless Area. The regulation at 36 CFR 294 "Roadless Area Conservation Rule" prohibits road construction or reconstruction and timber harvest to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

Comparison of the Alternatives

Table 1: Comparison of the Alternatives

	1990 LRMP Proposed RNA (No Action Alternative)	**Proposed Action**
Acres of Proposed RNA at Many Lakes	**750**	0
Acres of Established RNA at Many Lakes	0	**907**
Short-term Management (< 10 years)	Continue Management Direction of proposed RNA under LRMP MA-2 S&Gs until Forest Plan revision.	Continue Management Direction of established RNA with existing LRMP S&Gs for MA-2.
Long-term Management (> 10 years)	To be determined during forest plan revision.	

Chapter 3: Environmental Consequences

This chapter discusses the potential effects on the human environment resulting from the implementation of the no action or proposed action alternatives. This analysis tiers to the Deschutes National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision (USDA Forest Service 1990b).

Management Allocations

The proposed RNA boundary modifications will not have a measurable effect on Forest Plan goals, objectives, or outputs when considered in context of the Deschutes National Forest. The RNA would total 907 acres which is less than one of half of one percent of the Forest.

The proposed boundary modification would result in a net reduction of 157 acres in Management Area 9 Scenic Views, and a net increase in Management Area 2 Research Natural Areas (Figure 2). This modification would not have an effect on potential activities that could take place in that area because it is already subject to the Roadless Conservation Rule which is more restrictive than MA-9.

The Many Lakes RNA is located within the Cultus Mountain LSR. The focus on LSRs is on providing habitat for species associated with late and old structure forest conditions. The proposed boundary modification will not change the LSR allocation; there will be no change in acreage to any Northwest Forest Plan allocations.

Forest Plan Amendment – Assessment of Significance

According to Forest Service Manual (FSM) 1926.51, the following items describe non-significant amendments:

- Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management;
- Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management;
- Minor changes in standards and guidelines; and/or
- Opportunities for additional projects or activities that will contribute to achievement of the management prescriptions.

The conversion from a proposed RNA to an established RNA would not alter the currently described goals for the area, the boundary modifications are minor, no standards and guidelines will change, and the area will permanently be subject to the management prescriptions for RNAs.

Threatened, Endangered, and Sensitive Fish Species

A Biological Evaluation (BE) was prepared in compliance with the requirements of Forest Service Manual 2630.3, FSM 2670-2671, FSM W.O. Amendments 2600-95-7, and the Endangered Species Act of 1973.

The RNA is located in a diverse area of numerous small lakes and ponds, fens and wet meadows, steep slopes and rock escarpments. Raft Lake, in the northwest corner of the RNA, has a surface area of approximately 10 acres (4 hectares) and is the deepest lake in the RNA. The RNA is outside of Little Cultus Lake proper as the boundary extends only to the above the identified high water mark. Extensive wetland complexes occur on slopes and in depressional areas and include fens, sloping fens, wet meadows, shrub swamps, shallow ponds and seasonal streams. The fens and wet meadow habitats occupy approximately 115 acres of the RNA, and lakes and ponds cover another 20 acres. The remainder of the RNA is forested with lodgepole pine, Engelmann spruce, mountain hemlock, western hemlock (*Tsuga heterophylla*), white fir x grand fir hybrid (*Abies concolor x grandis*), western white pine (*Pinus monticola*), ponderosa pine (*Pinus ponderosa),* and whitebark pine (*Pinus albicaulis*).

For aquatics there are no threatened or endangered species or designated critical habitat within the proposed RNA therefore the action will have no effect on any aquatic threatened or endangered aquatic species.

Species classified as sensitive by the Forest Service are to be considered by conducting biological evaluations (BE) to determine potential effects of all programs and activities on these species (FSM 2670.32). The BE is a documented review of Forest Service activities in sufficient detail to determine how a proposed action may impact sensitive aquatic species, and to comply with the requirements of the Endangered Species Act.

The Forest Service Region 6 Sensitive Species List (USDA 2011) was reviewed for species that may be present on the Deschutes National Forest. There are no listed sensitive aquatic species located within the proposed RNA. Just outside of the proposed RNA in Little Cultus Lake is redband trout and associated habitats.

Summary of Conclusions for Sensitive Species

1. The No Action Alternative serves as a baseline for all sensitive species.
2. Implementation of the Proposed Action will have **"No Impact"** to the redband trout and its habitats for the Deschutes National Forest.

Environmental Consequences

Proposed Action

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to redband trout and its habitat.

Cumulative Effects

Implementation of proposed action for the Designation of the Katsuk Butte RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the redband trout and its habitat.

Determination

The proposed action is programmatic in nature and there will be no change from the existing

condition. Therefore, implementation of the proposed action will have a **"No Impact"** to redband trout and its habitat.

Consistency

Implementation of the Designation of the Katsuk Butte RNA is consistent with the Deschutes Land and Resource Management Plan and the Northwest Forest Plan. There are no ground disturbing activities associated with this designation therefore it is consistent with the Aquatic Conservation Strategy Objectives and maintains the existing conditions for aquatic habitats.

Threatened, Endangered, and Sensitive Plant Species

A BE has been prepared to determine potential effects from the proposed action on threatened, endangered, and sensitive plants in compliance with direction in the FSM 2672.4. Species considered are those on the current Regional Forester's Sensitive Species List (USDA Forest Service 2011) that are documented or suspected to occur on the Deschutes National Forest (see Appendix A of the Plant BE).

Summary

Whitebark pine (*Pinus albicaulis*) is a Candidate species for Federal listing as Threatened or Endangered. The Proposed Action to officially designate Many Lakes as a Research Natural Area would have a beneficial effect on this species. There are no adverse effects to whitebark pine from the proposed action.

Two populations of a Sensitive plant species, *Schuechzeria palustris* spp. *americana*, occur in Many Lakes RNA. The Proposed Action would have a beneficial effect to this species and its habitat.

Existing Condition

The proposed Many Lakes RNA encompasses glaciated uplands 3 miles (4.8 kilometers) east of the crest of the Central Oregon Cascades and just west of Little Cultus Lake. The RNA is located in a diverse area of numerous small lakes and ponds, fens and wet meadows, steep slopes and rock escarpments. Raft Lake, in the northwest corner of the RNA, has a surface area of approximately 10 acres (4 hectares) and is the deepest lake in the RNA. The RNA is outside of Little Cultus Lake proper as the boundary extends only to the above the identified high water mark. Extensive wetland complexes occur on slopes and in depressional areas and include fens, sloping fens, wet meadows, shrub swamps, shallow ponds and seasonal streams. The fens and wet meadow habitats occupy approximately 115 acres of the RNA, and lakes and ponds cover another 20 acres. The remainder of the RNA is forested with lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), mountain hemlock (*Tsuga mertensiana*), western hemlock (*Tsuga heterophylla*), white fir x grand fir hybrid (*Abies concolor x grandis*), western white pine (*Pinus monticola*), ponderosa pine (*Pinus ponderosa),* and whitebark pine (*Pinus albicaulis*).
Whitebark pine (*Pinus albicaulis*), a candidate for Federal listing as Threatened or Endangered, occurs within the proposed Many Lakes RNA.

The U.S. Forest Service Regional Forester lists 69 Sensitive plant species as suspected or documented to occur on the Deschutes National Forest Sensitive (see Appendix A of Botany BE): 36 vascular plants (18 documented to occur), 26 bryophytes (11 documented), 2 lichens (1 documented) and 5 fungi (4 documented).

A pre-field review was completed to determine if any of the 69 Sensitive plant species occur within the RNA. The following sources were used in this review:

1. U.S. Forest Service NRIS-TESP-Invasives Database which is where U.S. Forest Service Sensitive plant locations are entered and tracked.
2. Vascular Plant Species List and field notes of rare plant sightings provided by Carex Working Group (2008, 2010)
3. Many Lakes RNA Plant Species List (USDA Forest Service 2010).

There are two known populations of a Sensitive plant: rannoch-rush (*Scheuchzeria palustris* spp. *americana*).

The vegetation of Many Lakes RNA has not been systematically studied with the exception of one fen in which permanent vegetation monitoring transects have been installed. However, the area has been visited numerous times and several plant species lists have been compiled for the area (USDA Forest Service 1990; Christie and Wilson 1986; Schuller 2008, Carex Working Group 2008).

Environmental Consequences

Under both the No Action and Proposed Action, Many Lakes RNA would continue to be managed as a Research Natural Area. Research Natural Areas are part of a national network of ecological areas designated for research, monitoring, education, and to maintain biological diversity (USDA Forest Service Manual 4063). RNAs are managed to allow natural processes to occur and to minimize human disturbance (USDA Forest Service Manual 4063.3).

The Proposed Action would guarantee that the RNA would be managed to maintain biological diversity into perpetuity. Management of RNAs is beneficial to plants and their habitats.

Direct and Indirect Effects

There would be no direct or indirect negative effects to the known populations of rannoch-rush and whitebark pine. Establishment of Many Lakes RNA would have a beneficial effect to these species because the RNA would be managed to maintain biodiversity with limited human disturbance, thus protecting these populations and their habitat.

Cumulative Effects

Implementation of the proposed action for the Designation of Many Lakes RNA will not result in any direct or indirect adverse effects and, therefore, will not result in any cumulative effects to rannoch-rush or whitebark pine.

Threatened, Endangered, and Sensitive Wildlife

A BE has been completed to assess the effects of the proposed establishment of the RNA on federally threatened, endangered, candidate or proposed species, and Region 6 Sensitive Species. The BE is intended to ensure that all management actions are in compliance with the Endangered Species Act (ESA) of 1973, NFMA, NEPA, and the Forest Plan as amended. The BE is located in the project file.

Table 2: Threatened and Endangered Species Summary

Species	Status	Habitat	Presence
Northern Spotted Owl	Federal Threatened, MIS	Old Growth Mixed Conifer Forests	Yes
Gray Wolf	Federal Endangered	Generalist	Yes
Oregon Spotted Frog	Federal Proposed Threatened, Regional Forester Sensitive	Stream, Marsh	Yes
Northern Spotted Owl Critical Habitat			Yes
Oregon Spotted Frog Proposed Critical Habitat			Yes

Summary of Conclusion of Effects, Threatened and Endangered Species.

Species/Habitat	Action Alternatives
Northern Spotted Owl	**"No Effect"**
Gray Wolf	**"No Effect"**
Oregon Spotted Frog	**"No Effect"**
Northern Spotted Owl Critical Habitat	**"No Effect"**
Oregon Spotted Frog Proposed Critical Habitat	**"No Effect"**

Summary of Conclusions for T&E Species

1. The Proposed Action will have "**No Effect**" on the northern spotted owl, Oregon spotted frog, or gray wolf and their habitats. Consultation is not required.

2. The Proposed Action will have "**No Effect**" on designated critical habitat for the northern spotted owl or proposed critical habitat for the Oregon spotted frog. Consultation is not required.

Northern Spotted Owl, Federal Threatened, MIS

The BE includes a thorough description of the habitat and prey needs for the northern spotted owl and its critical habitat on the Deschutes National Forest. The Many Lakes RNA includes approximately 36 acres of spotted owl nesting, roosting and foraging (NRF) habitat and 843 acres of dispersal habitat. The RNA is also located within critical habitat (ECN9).

Environmental Consequences

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed

action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to suitable spotted owl habitat, dispersal habitat, known home ranges, or designated Critical Habitat.

Cumulative Effects

Implementation of proposed action for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the spotted owl and its habitat.

Determination

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a **"No Effect"** to spotted owls and their habitat.

Critical Habitat Units

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a **"No Effect"** to spotted owls critical habitat.

Communication with U.S. Fish and Wildlife Service

This project is not covered under the current FY2014 Programmatic Biological Assessment. Further communication with U.S. Fish and Wildlife Service is not recommended.

Consistency

Implementation of the Designation of the Many Lakes RNA is consistent with the Deschutes Land and Resource Management Plan, the Deschutes National Forest Late-Successional Reserve Assessments, and the 2011 Critical Habitat Rule.

Gray Wolf, Federally Endangered

Gray wolves were protected by the Endangered Species Act of 1973 when only a few hundred remained in extreme northeastern Minnesota and a small number on Isle Royale, Michigan. They were listed as Endangered in the contiguous 48 states except in Minnesota where they were listed as Threatened. The U.S. Fish and Wildlife Service initiated wolf recovery efforts in the 1980s focusing on the northern Rocky Mountains, the western Great Lakes region, and the Mexican gray wolf recovery area in Arizona and New Mexico. In 1994 portions of Idaho, Montana, and Wyoming were designated as two nonessential experimental population areas leading to the gray wolf reintroduction into Yellowstone National Park and U.S. Forest Service lands in central Idaho in 1995 and 1996 (Federal Register 2011). The reintroduction has been successful and recovery goals for this population have been exceeded with wolves now populating areas outside the reintroduction zone including packs in north eastern Oregon.

The BE includes a thorough description of the habitat needs and existing habitat for the gray wolf on the Deschutes National Forest.

Environmental Consequences

Proposed Action

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to gray wolf habitat.

Cumulative Effects

Implementation of proposed action for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the gray wolf and its habitat.

Determination

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a "No Effect" to gray wolves and their habitat.

Consistency

Implementation of the Designation of the Many Lakes RNA is consistent with the Deschutes Land and Resource Management Plan.

Oregon Spotted Frog, Federal Proposed

The BE includes a thorough description of the Oregon spotted frogs and their habitat requirements. The Oregon spotted frog inhabits emergent wetland habitats in forested landscapes, although it is not typically found under forest canopy. This is the most aquatic native frog species in the Pacific Northwest, as all other species have a terrestrial life stage. It is almost always found in or near a perennial body of water, such as a spring, pond, lake, sluggish stream, irrigation canal, or roadside ditch (Engler 1999, pers. comm.).

The Proposed Rule for the designation of critical habitat for the Oregon spotted frog was published in the Federal Register on August 29, 2013 (50 CFR Part 17). Proposed critical habitat occurs on the Deschutes National Forest and approximately 24 acres of proposed critical habitat occurs within the Many Lakes RNA.

Environmental Consequences

Proposed Action

Direct and Indirect Effects

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to Oregon spotted frog habitat or proposed Critical Habitat.

Cumulative Effects

Implementation of proposed action for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Oregon spotted frog and its habitat.

Determination

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a "No Effect" to Oregon spotted frogs and their habitat.

Critical Habitat Units

The proposed action is programmatic in nature and there will be no change from the existing condition. Therefore, implementation of the proposed action will have a "No Effect" to proposed Oregon spotted frog critical habitat.

Consistency

Implementation of the Designation of the Many Lakes RNA is consistent with the Deschutes Land and Resource Management Plan, and the 2014 Proposed Critical Habitat Rule.

Regional Forester's Sensitive Species

Species classified as sensitive by the Forest Service are to be considered by conducting biological evaluations (BE) to determine potential effects of all programs and activities on these species (FSM 2670.32). The BE is a documented review of Forest Service activities in sufficient detail to determine how a proposed action may impact sensitive wildlife species, and to comply with the requirements of the Endangered Species Act.

The Forest Service Region 6 Sensitive Species List (USDA 2011) was reviewed for species that may be present on the Deschutes National Forest. After a review of records, habitat requirements, and existing habitat components, it was determined the following sensitive animal species have habitat or are known to occur in the project area and will be included in this analysis:

Table 3: Sensitive Species Summary for the Deschutes National Forest.

Species	Status	Habitat	Habitat/Species Present
Northern Bald Eagle (*Haliaeetus leucocephalus*)	Regional Forester Sensitive, MIS	Lakeside with Large Trees	No
Bufflehead (*Bucephala albeola*)	Regional Forester Sensitive	Lakes, Snags	Yes
Harlequin Duck (*Histrionicus histrionicus*)	Regional Forester Sensitive	Rapid Streams, Large Trees	No
Tricolored Blackbird (*Agelaius tricolor*)	Regional Forester Sensitive	Lakeside, Bullrush	No
Yellow Rail (*Coturnicops noveboracensis*)	Regional Forester Sensitive	Marsh	Yes
Greater (Western) Sage Grouse (*Centrocercus urophasianus phaeios*)	Federal Candidate, Regional Forester Sensitive	Sagebrush Flats	No
American Peregrine	Regional Forester	Riparian, Cliffs	No

Falcon (*Falco peregrinus anatum*)	Sensitive, MIS		
Lewis' Woodpecker (*Melanerpes lewis*)	Regional Forester Sensitive, MIS	Large, open ponderosa pine and burned forests	No
White-headed Woodpecker (*Picoides albolarvatus*)	Regional Forester Sensitive, MIS	Large, open ponderosa pine	No
Northern Waterthrush (*Seiurus noveboracensis*)	Regional Forester Sensitive	Riparian vegetation including willows and alder	No
Horned Grebe (*Podiceps auritus*)	Regional Forester Sensitive, MIS	Lakes	No
Tule White-fronted Goose (*Anser albifrons elgasi*)	Regional Forester Sensitive, MIS	Large rivers, marsh/lakeshore habitat with emergent vegetation	No
Pacific Fisher (*Martes pennanti*)	Federal Candidate, Regional Forester Sensitive	Mixed, Complex	Yes
North American Wolverine (*Gulo gulo luscus*)	Regional Forester Sensitive, MIS	Mix, High Elevation	No
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	Regional Forester Sensitive, MIS	Caves	No
Pallid Bat (*Antrozous pallidus*)	Regional Forester Sensitive	Canyons, cliffs, caves, and buildings	No
Spotted Bat (*Euderma maculatum*)	Regional Forester Sensitive	Canyons, cliffs, caves, and buildings	No
Fringed Myotis (*Myotis thysanodes*)	Regional Forester Sensitive	Canyons, cliffs, caves, buildings, and large snags	No
Columbia Spotted Frog (*Rana luteiventris)*	Federal Candidate, Regional Forester Sensitive	Stream, Marsh	No
Crater Lake Tightcoil (*Pristiloma arcticum crateris*)	Regional Forester Sensitive	Riparian, Perennially Wet	Yes
Evening Field Slug (*Deroceras hesperium*)	Regional Forester Sensitive	Perennially wet meadows	Yes
Silver-bordered Fritillary (*Boloria selene atrocostalis*)	Regional Forester Sensitive	Open riparian bogs and marshes	Yes
Johnson's Hairstreak (*Mitoura johnsonii*) (*Callophrys johnsonii*)	Regional Forester Sensitive	Coniferous forests with mistletoe	Yes
Western Bumblebee (*Bombus occidentalis*)	Regional Forester Sensitive	Meadows with floral resources	Yes

Summary of Conclusions for Sensitive Species

1. The No Action Alternative serves as a baseline for all sensitive species.

2. Implementation of Proposed Action will have **"No Impact"** to the bufflehead, yellow rail, Pacific fisher, Crater Lake tightcoil, evening field slug, silver-bordered fritillary, Johnson's hairstreak, and western bumble bee and their habitats for the Deschutes National Forest.

3. There is no habitat in the Proposed RNA for the bald eagle, harlequin duck, tri-colored blackbird, greater sage grouse, American peregrine falcon, Lewis' woodpecker, white-headed woodpecker, northern waterthrush, horned grebe, Tule white-fronted goose, North American wolverine, Townsend's big-eared bat, spotted bat, pallid bat, fringed myotis, and Columbia spotted frog.

After a review of records, habitat requirements, and existing habitat components, it was determined the remaining sensitive species do not occur and have no habitat in the project area and will not be included in any further analysis: bald eagle, harlequin duck, tricolored blackbird, greater sage grouse, peregrine falcon, Lewis' woodpecker, white-headed woodpecker, northern waterthrush, horned grebe, Tule white-fronted goose, North American wolverine, Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, and Columbia spotted frog. The rationale for that determination is found in the BE.

Table 4 displays those Region 6 Sensitive Species that are known to occur or have habitat within the Many Lakes RNA.

Table 4: Summary of Conclusion of Impacts, Region 6 Sensitive Species for the Designation of the Many Lakes RNA.

Species	Action Alternative
Bufflehead	**NI**
Yellow Rail	**NI**
Pacific Fisher	**NI**
Crater Lake Tightcoil	**NI**
Evening Field Slug	**NI**
Silver-bordered Fritillary	**NI**
Johnson's Hairstreak	**NI**
Western Bumblebee	**NI**

NI = No Impact
MIIH = May impact individuals or habitat, but will not likely contribute a trend toward federal listing or loss of viability to the population or species
BI = Beneficial Impact

Bufflehead, R6 Sensitive, MIS

Buffleheads are the smallest diving ducks in North America. For Oregon, NatureServe (2014) lists them as S2B, Imperiled Breeding and S5N, Secure Non-breeding. They are local uncommon breeders in the central Cascades. Buffleheads utilize lakes, ponds, rivers, and seacoasts. Known nesting locations include Hosmer Lake, Crane Prairie Reservoir, Twin Lakes, Wickiup Reservoir, Davis Lake and along the Little Deschutes River (Marshall et al. 2003 p. 124-125). Buffleheads nest at high elevation forested lakes in the central Cascades using natural cavities (abandoned northern flicker holes) and artificial nest boxes in mixed coniferous-deciduous woodlands near lakes and ponds (Gilligan et al. 1994 in Marshall et al. 2003 p.124-125). Females often nest in the same site in successive years (NatureServe 2004). This duck eats both animal and plant material. However, during the breeding season, aquatic insects and larvae are the most important item in their diet. They also eat seeds of pondweeds and bulrushes (Csuti et al. 1997 p. 100). Buffleheads winter throughout Oregon in open waters (Marshall et al. 2003).

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to bufflehead.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the bufflehead and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable bufflehead habitat. Therefore, the Action Alternative will have **"No Impact"** to bufflehead or their habitat.

Yellow Rail, R6 Sensitive

Yellow Rail breeding takes place in emergent wetlands, grass or sedge and wet meadows in freshwater situations. From information gathered over the last six years, nesting habitat of the yellow rail in Oregon has been described as marshes or wet meadows which have an abundance of thin-leaved sedges, a layer of senescent vegetation to conceal their nests, and an average water depth of 7 cm (Popper 2001).

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to yellow rail.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the yellow rail and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable yellow rail habitat. Therefore, the Action Alternative will have **"No Impact"** to yellow rail or their habitat.

Pacific Fisher, Federal Candidate, Region 6 Sensitive

Existing Condition/No Action

Fisher populations are considered to be extremely low in Oregon, Washington, and parts of the Rocky Mountains. They occur in landscapes dominated by late-successional and mature forests. Fishers have been found to use riparian areas disproportionately to what exists. On the Westside of the Cascades, fishers tend to be associated with low to mid-elevational forests dominated by late-successional and old growth Douglas-fir and western hemlock. However, on the eastside of the Cascades, they occur at higher elevations in association with true firs and mixed conifer forests. They tend to prefer areas with high canopy closure and late-successional forests with relatively low snow accumulations. Critical features of fisher habitat include physical structure of the forest and prey associated with forest structure. Structure includes vertical and horizontal complexity created by a diversity of tree sizes and shapes, light gaps, down woody material, and layers of overhead cover. Major prey species include small to medium sized mammals, birds, and carrion. Porcupine are the best known prey species but fisher will also prey on snowshoe hare, squirrels, mice and shrews. (Powell and Zielinski 1994)

Large forest openings, open hardwood forests, and recent clearcuts were found to be infrequently used by fishers in the West (Ruggerio et. al 1994). Fishers have shown an aversion to open areas and this has affected local distributions and can limit population expansion and colonization of unoccupied areas (Coulter 1966, Earle 1978). However, Kelly (1977) found that fishers tended to use recently harvested areas when brush and saplings provided some low overhead cover but these areas were avoided during the winter.

Habitat for the Pacific fisher occurs in very minor amounts on the Deschutes National Forest in the following plant associations – lodgepole pine wet, white fir, Shasta red fir, western hemlock, silver fir, and mountain hemlock in closed stands where average tree size is 20"dbh or greater.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to Pacific fisher habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Pacific fisher and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable Pacific fisher habitat. Therefore, the Action Alternative will have **"No Impact"** to the Pacific fisher or their habitat.

Crater Lake Tightcoil, Region 6 Sensitive

Existing Condition/No Action

"The Crater Lake Tightcoil may be found in perennially wet situations in mature conifer forests, among rushes, mosses and other surface vegetation or under rocks and woody debris within 10 m. of open water in wetlands, springs, seeps and riparian areas, generally in areas which remain under snow for long periods during the winter. Riparian habitats in the Eastern Oregon Cascades may be limited to the extent of permanent surface moisture, which is often less than 10 m. from open water" (Duncan et al. 2003).

Threats to the species include activities that compact soils, reduce litter and/or vegetative cover, or impact potential food sources (i.e. livestock grazing, heavy equipment use, ORV's, and camping on occupied habitats). Fluctuations from removal of ground vegetation on ground temperature and humidity may be less extreme at higher elevations and on wetter sites, but no studies have been conducted to evaluate such a theory. These snails appear to occur on wetter sites than general forest conditions, so activities that would lower the water table or reduce soil moisture would degrade habitat (Burke et al. 1999).

Intense fire that burns through the litter and duff layers is devastating to most gastropods, and even light burns during seasons when these animals are active can be expected to have more serious impacts than burns during their dormant periods. Snowmobiling or skiing would impact these snails if snow, over their occupied habitats, is compacted losing its insulative properties and allowing the litter or ground to freeze (Burke et al. 1999).

Habitat for the Crater Lake tightcoil includes Class 1, 2, 3, and 4 streams and lake and wetland buffers. Suitable habitat specific to the Crater Lake tightcoil has not been mapped at this time as assessments are generally conducted at a project level.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to Crater Lake tightcoil habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Crater Lake tightcoil and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable Crater Lake tightcoil habitat. Therefore, the Action Alternative will have **"No Impact"** to the Crater Lake tightcoil or their habitat.

Evening Field Slug, Region 6 Sensitive

Existing Condition/No Action

Scattered sites have been documented for the Evening field slug in several provinces in Oregon, including both sides of the Oregon Cascades from Hood River to the Klamath River basin in Jackson County; and from the Elliot State Forest north in the northern Coast Range. The majority of currently documented sites occur on the eastern slopes of the Oregon Cascades. The type locality was in Oswego, OR, the paratype locality in Hood River. The range extends through western Washington and on to Vancouver Island, B.C.

The Evening Fieldslug is associated with perennially wet meadows in forested habitats; microsites include a variety of low vegetation, litter and debris; rocks may also be used as refugia. Little detail is known about exact habitat requirements for the species, due to the limited number of verified sites. However, this species appears to have high moisture requirements and is almost always found in or near herbaceous vegetation at the interface between soil and water, or under litter and other cover in wet situations where the soil and vegetation remain constantly saturated. Because of the apparent need for stable environments that remain wet throughout the year, suitable habitat may be considered to be limited to moist surface vegetation and cover objects within 30 m. (98 ft.) of perennial wetlands, springs, seeps and riparian areas. Areas with coastal fog may allow the species to occupy habitats farther from open water. Down wood may provide refugia sites for the species that remain more stable during drier periods of the year than the general habitat.

Primary threats to this species are habitat loss from draining and conversion of wet meadows for agricultural, urbanization, grazing, forest management and other uses; and from fire. Natural threats may include ingrowth of conifer or hardwood tree and shrub species in historically herbaceous habitats, changes in hydrology that reduce the availability of water in wetlands, and exposure to vertebrate and invertebrate predators (i.e., predatory snails and beetles), especially in locally restricted areas.

A study conducted by Guralnick and Roth (2013) on the Fremont Winema NF found that *Deroceras hesperium* is likely an anatomical variant of *Deroceras laeve*, a more common and widespread species.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to evening field slug habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the evening field slug and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable evening field slug habitat. Therefore, the Action Alternative will have **"No Impact"** to the evening field slug or their habitat.

Silver-bordered Fritillary, Region 6 Sensitive

Existing Condition/No Action

The silver-bordered fritillary is a holarctic species ranging from the Appalachians, Midwest, Rockies, and the Cascades. This species is known from three locations in Oregon – Big Summit Prairie (Crook Co.), the Strawberry Mountains (Grant Co.), and the southern Wallowa range north of Halfway (Baker Co.) (Pyle 2002, Warren 2005). They are associated with open riparian areas, bogs, and marshes dominated by *Salix* and larval foodplants (marsh violet, bog violet). The adults nectar on various composites, mints, and *Verbena*. Populations from Crook and Grant counties fly from early June to mid-August, in what is apparently a single annual brood. Threats include small populations that are stressed by habitat succession and drying (Pyle 2002).

Habitat for the silver-bordered fritillary includes wetlands. Wetlands include both the wetland and the associated buffer. Suitable habitat specific to the silver-bordered fritillary has not been mapped at this time as assessments are generally conducted at a project level.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to silver-bordered fritillary habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the silver-bordered fritillary and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable silver-bordered fritillary habitat. Therefore, the Action Alternative will have **"No Impact"** to the silver-bordered fritillary or their habitat.

Johnson's Hairstreak, Region 6 Sensitive

Existing Condition/No Action

The Johnson's hairstreak is an uncommon butterfly with a distribution limited to the Pacific Northwest (USFS 2008b). It has been documented from Salem, Eugene, Coos Bay and Medford BLM districts and from the Willamette, Deschutes, Umpqua, Rouge-River/Siskiyou, Fremont-Winema, Umatilla and Wallowa-Whitman National Forests. Most Oregon records (n=52) are from 2000' elevation or greater with the majority from 3500' or more to 5-6000' elevation. They are thought to be late-successional associated because of its dependence upon dwarf mistletoe. Dwarf mistletoes generally increase in incidence and intensity in older stands, however both young and maturing stands host this as well (USFS 2008b).

Larvae feed exclusively on the aerial shoots of dwarf mistletoes (USFS 2008b). Adults sip nectar at available flowers of several species (Actostaphylos, Ceanothus, Cornus, dandelion, Fragaria, Rorippa, and Spraguea) and nearby water and mud puddles (USFS 2008b). There are several closely related species with overlapping ranges making identification difficult. The Thicket Hairstreak larvae are undistinguishable with those of the Johnson's Hairstreak. Since this species spends so much time in the top of the forest canopy this may limit detection.

Threats to this species includes timber harvest in mistletoe infested areas, large stand replacement fires, Btk (insecticide) use, herbicide use on forage species, and possible hybridization with the Thicket Hairstreak (USFS 2008b).

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects Johnson's hairstreak habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Johnson's hairstreak and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable Johnson's hairstreak habitat. Therefore, the Action Alternative will have **"No Impact"** to the Johnson's hairstreak or their habitat.

Western Bumble Bee, Region 6 Sensitive

Existing Condition/No Action

The western bumblebee was once widespread and common throughout the western United States and western Canada before 1998. Since 1998 populations of this bumblebee species have declined drastically throughout parts of its former range. Populations in central California, Oregon, Washington and southern British Columbia have mostly disappeared. NatureServe (2013) reported this species has declined about 70-100% since the late 1990s in many places, especially from British Columbia to California. For Oregon, NatureServe (2014) lists them as S1, Critically Imperiled and S2N, Imperiled. It is difficult to accurately assess the magnitude of these declines since most of this species' historic range has not been sampled systematically (Xerces Society 2012, Andrews 2010). Western bumble bees have been documented on the Deschutes National Forest near Sparks Lake and in the Sunriver vicinity.

The Xerces Society website (Xerces Society 2012) stated there are a number of threats facing bumblebees, any of which may be leading to the decline of *Bombus occidentalis*. The major threats to bumble bees include: spread of pests and diseases by the commercial bumble bee industry, other pests and diseases, habitat destruction or alteration, pesticides, invasive species, natural pest or predator population cycles, and climate change. Commercial bumblebee rearing is thought to be the greatest threat to the western bumblebee. Bumblebee expert, Dr. Robbin Thorp (Univ. of California, Davis) has hypothesized western bumblebee queens shipped to Europe to produce new colonies and then shipped back to the United States may have acquired a disease (mircosporidium *Nosema bombi*) from a European bumblebee at the same rearing facility. The western bumblebee would have had no prior resistance to this pathogen. While this hypothesis needs validation, the timing, speed, and severity of the population crashes strongly supports the idea that an introduced disease caused the decline of bees (Xerces Society 2012).

An unpublished document prepared by the Xerces Society (Xerces Society 2013) stated the primary threats to the western bumblebee at the sites where it currently exists in Oregon and Washington include: pathogens from commercial bumble bees and other sources, impacts from reduced genetic diversity, and habitat alterations including conifer encroachment (resulting from fire suppression), grazing, and logging. Other threats include pesticide use, fire, agricultural intensification, urban development and climate change. Indirect effects of logging (such as increased siltation in runoff) and recreation (such as off-road vehicle use) also have the potential to alter meadow ecosystems and disrupt habitat. Additional habitat alterations, such as conifer encroachment resulting from fire suppression, fire, agricultural intensification, urban, and climate may threaten the western bumblebee. (Xerces Society 2013).

Management consideration for the western bumblebee mentioned by the Xerces Society in protecting all known and potential sites from practices, such as livestock grazing, and threats such as conifer encroachment, that can interfere with the habitat requirements of this species (availability of nectar and pollen throughout the colony season and availability of underground nest sites and hibernacula).

Most common management activities should not directly affect underground nests; however, bumble bees above ground in grasses would be vulnerable to fire and to mowing if the blade is low enough to destroy them. Hibernating queens and workers could be very vulnerable to prescribed burns if they are above ground in dry microhabitats. Thinning and prescribed burning may have positive or negative effects: direct mortality to the pollinators and change in vegetation composition and structure (NatureServe 2013). Long term, these treatments would benefit

bumblebees by reducing encroaching conifers and maintain an open meadow/brush habitat. Maintaining a diverse assemblage of primarily native flora such that flowers would be constantly available throughout the active season of April to September would benefit bumble bees (NatureServe 2013).

Native bees including bumblebees are adapted to local weather conditions and can forage during cold, rainy periods. Bumble bees are generalist foragers, meaning they gather pollen and nectar from a wide variety of flowering plants and need a constant supply of flowers in bloom from spring to autumn (Evans et al. 2008). The western bumblebee visits a wide variety of wildflowers including Aster spp., Gaultheria shallon (salal), Pedicularis (Elephant's Head), Penstemon, Phacelia, Prunus spp. (cherry), Rhododendron spp., Solidago spp. (Goldenrod), Symphoricarpos spp. (snowberry), Trifolium spp. (clovers), Salix (willow) plus many others. Commercially reared colonies of western bumblebees have been used extensively for pollination of greenhouse tomatoes and field berry crops in the western United States (Evans et al. 2008). Wild colonies of western bumblebees have also been significant pollinators of cranberry farms. The species is also used to pollinate alfalfa, apples, cherries, blackberries and blueberries.

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to western bumble bee habitat.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the western bumble bee and its habitat.

Determination

Implementation of the Designation of the Many Lakes RNA will result in no change to suitable western bumble bee habitat. Therefore, the Action Alternative will have **"No Impact"** to the western bumble bee or their habitat.

Wildlife other than Threatened, Endangered, and Sensitive

The Wildlife Report documents the review of activities and projects to meet the requirements of the Forest Service Manual (2634.03-.2), the National Forest Management Act, the Land and Resource Management Plan (LRMP) for the Deschutes National Forest, the Northwest Forest Plan (NWFP), and the Decision Notice for the Continuation of Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales (i.e. "Eastside Screens"), and the Landbird Strategies. The Wildlife Report is summarized in this EA; the full report is located in the project file.

Species and Habitats

The following wildlife/habitats have been reviewed to determine if the project/activity will have any negative effects on them including LRMP Management Indicator Species (MIS), NWFP Survey and Manage (S&M) species, and landbirds.

The Deschutes National Forest Land and Resource Management Plan (LRMP) (USDA 1990a) identified a group of wildlife species as management indicator species (MIS). These species were selected because they represent other species with similar habitat requirements. Management indicator species can be used to assess the impacts of management activities for a wide range of wildlife species with similar habitat needs (FSM 2620.5).

In addition to the above mentioned MIS species there have been a number of wildlife species deemed "species of concern" either through the Northwest Forest Plan (e.g. bats; pg C-43) or through other directives (e.g., landbirds).

Management Indicator Species

Table 5: Deschutes NF Management Indicator Species Summary

Species	Habitat	Habitat in Project Area
Northern Goshawk (*Accipiter gentiles*)	Mature and old-growth forests; especially high canopy closure and large trees	Yes
Cooper's Hawk (*Accipiter cooperi*)	Similar to goshawk, can also use mature forests with high canopy closure/tree density	Yes
Sharp-shinned Hawk (*Accipiter striatus*)	Similar to goshawk in addition to young, dense, even-aged stands	Yes
Great Gray Owl (*Strix nebulosa*)	Mature and old growth forests associated with openings and meadows	No
Great Blue Heron (*Ardea herodias*)	Riparian edge habitats including lakes, streams, marshes and estuaries	Yes
Golden Eagle (*Aquila chrysaetos*)	Large open areas with cliffs and rock outcrops	No
Waterfowl	Lakes, ponds, streams	Yes
Woodpeckers (Cavity Nesters)	Snags, Mature Conifers, Hardwoods, etc.	Yes
Red-tailed Hawk (*Buteo jamaicensis*)	Large snags, open country interspersed with forests	Yes
Osprey (*Pandion haliaetus*)	Large snags associated with fish bearing water bodies	Yes
Townsend's Big-eared Bat	Caves and dwellings	No
American Marten (*Martes americana*)	Mixed Conifer or High Elevation late successional forests with abundant down woody material	Yes
Elk (*Cervus elephas*)	Mixed habitats	No
Mule Deer (*Odocoileus hemionus*)	Mixed habitats	Yes

Snags and Down Wood Associated Species and Habitat	Snags and down woody material	Yes

The following table displays the acres of potential habitat mapped within the proposed Many Lakes RNA.

Table 6: Acres of potential habitat for species within the proposed Many Lakes RNA.

Species	Acres of Potential Habitat	Percent of Proposed RNA
Northern Goshawk	574 acres	68%
Coopers Hawk	160 acres	19%
Sharp-shinned Hawk	344 acres	41%
Great Gray Owl	0	
Great Blue Heron	705 acres	84%
Golden Eagle	0	
Waterfowl	289 acres	34%
Black-backed Woodpecker	118 acres	14%
Hairy Woodpecker	2 acres	<1%
Northern Flicker	0	
Pileated Woodpecker	174 acres	21%
Three-toed Woodpecker	134 acres	16%
Williamson's Sapsucker	160 acres	19%
Red-tailed Hawk	94 acres	11%
Osprey	834 acres	99%
Townsend's Big-eared Bat	0	
American Marten	407 acres	48%
Elk Hiding Cover	0	
Elk Thermal Cover	0	
Mule Deer Hiding Cover	776 acres	92%
Mule Deer Thermal Cover	0	

Environmental Consequences

Proposed Action

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to the above management indicator species.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the above mentioned management indicator species and their habitats.

Determination

This project will not affect the above mentioned management indicator species in the project area. Therefore, the designation of the Many Lakes RNA project will not contribute to a negative trend in viability on the Deschutes National Forest for the above mentioned management indicator species.

Conservation Strategy for Eastslope of the Cascade Mountains

Landbird Strategic Plan

The Forest Service has prepared a Landbird Strategic Plan (January 2000) to maintain, restore, and protect habitats necessary to sustain healthy migratory and resident bird populations to achieve biological objectives. The primary purpose of the strategic plan is to provide guidance for the Landbird Conservation Program and to focus efforts in a common direction. On a more local level, individuals from multiple agencies and organizations with the Oregon-Washington Chapter of Partners in Flight participated in developing a publication for conserving landbirds in this region. A Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington was published in June 2000 (Altman 2000). This document outlines conservation measures, goals and objectives for specific habitat types found on the east-slope of the Cascades and the focal species associated with each habitat type. See Table 7 for specific habitat types highlighted in that document, the habitat features needing conservation focus and the focal bird species for each.

Table 7: East-slope Cascade Mountain landbirds.

Habitat	Habitat Feature	Focal Species for Central Oregon
Ponderosa Pine	Large patches of old forest with large snags	White-headed woodpecker
	Large trees	Pygmy nuthatch
	Open understory with regenerating pines	Chipping sparrow
	Patches of burned old forest	Lewis' woodpecker
Mixed Conifer (Late-Successional)	Large trees	Brown creeper
	Large snags	Williamson's sapsucker
	Interspersion grassy openings and dense thickets	Flammulated owl
	Multi-layered/dense canopy	Hermit thrush
	Edges and openings created by wildfire	Olive-sided flycatcher
Lodgepole Pine	Old growth	Black-backed woodpecker
Whitebark Pine	Old-growth	Clark's nutcracker
Meadows	Wet/dry	Sandhill Crane
Aspen	Large trees with regeneration	Red-naped sapsucker
Subalpine fir	Patchy presence	Blue Grouse

Birds of Conservation Concern

In January 2001, President Clinton issued an executive order on migratory birds directing federal agencies to avoid or minimize the negative impact of their actions on migratory birds, and to take active steps to protect birds and their habitats. Federal agencies were required within two years to develop a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service to conserve migratory birds including taking steps to restore and enhance planning processes whenever possible. To meet this goal in part the U.S. Fish and Wildlife Service developed the Birds of Conservation Concern released in December 2002 (USFWS 2002) and an update to the original list was released in 2008 (USFWS 2008).

The "Birds of Conservation Concern 2008" (BCC) identifies species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973. Bird species considered for inclusion on lists in this report include non-game birds, gamebirds without hunting seasons, subsistence-hunted non-game species in Alaska, landbirds, shorebirds, waterbirds, and Endangered Species Act candidate, proposed endangered or threatened, and recently delisted species. While all of the bird species included in BCC are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. The goal is to conserve avian diversity in North America and includes preventing or removing the need for additional ESA bird listings by implementing proactive management and conservations actions (USFWS 2008). The 2008 lists were derived from three major bird conservation plans: the Partners in Flight North American Landbird Conservation Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. Conservation concerns stem from population declines, naturally or human-caused small ranges or population sizes, threats to habitat, or other factors.

Bird Conservation Regions (BCRs) were developed based on similar geographic parameters and are the basic units within which all bird conservation efforts should be planned and evaluated (USFWS 2008). One BCR encompasses the Designation of the Many Lakes RNA Project Area – BCR 9, Great Basin. See Table 8 for a list of the bird species of concern for the area, the preferred habitat for each species, and whether there is potential habitat for each species within the Many Lakes project area.

Table 8: BCR 9 (Great Basin) BCC 2008 list.

Bird Species	Preferred Habitat	Habitat within the Project Area (Y or N)
Greater Sage Grouse (Columbia Basin DPS)	Sagebrush dominated Rangelands	N
Eared Grebe (non-breeding)	Open water intermixed with emergent vegetation	N
Bald Eagle	Lakeside with large trees	N
Ferruginous Hawk	Elevated Nest Sites in Open Country	N
Golden Eagle	Elevated Nest Sites in Open Country	N
Peregrine Falcon	Cliffs	N

Yellow Rail	Dense Marsh Habitat	Y
Snowy Plover	Dry Sandy Beaches	N
Long-billed Curlew	Meadow/Marsh	Y
Marbled Godwit	Marsh/Wet Meadows	N
Yellow-billed Cuckoo	Dense riparian/cottonwoods	N
Flammulated Owl	Ponderosa pine forests	N
Black Swift	Cliffs associated with waterfalls	N
Calliope Hummingbird	Open mountain meadows, open forests, meadow edges, and riparian areas	Y
Lewis's Woodpecker	Ponderosa pine forests	N
Williamson's Sapsucker	Ponderosa pine forests	Y
White-headed Woodpecker	Ponderosa pine forests	N
Loggerhead Shrike	Open country with scattered trees or shrubs	N
Pinyon Jay	Juniper, juniper-ponderosa pine transition, and ponderosa pine edges	N
Sage Thrasher	Sagebrush	N
Virginia's Warbler	Scrubby vegetation within arid montane woodlands	N
Green-tailed Towhee	Open ponderosa pine with dense brush	N
Brewer's Sparrow	Sagebrush clearings in coniferous forests/bitterbrush	N
Black-chinned Sparrow	Ceanothus and oak covered hillsides	N
Sage Sparrow	Unfragmented patches of sagebrush	N
Tricolored Blackbird	Cattails or Tules	N
Black Rosy Finch	Rock outcroppings and snowfields	N

Impacts Analysis:

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to the above landbirds or Birds of Conservation Concern.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the above mentioned landbirds or birds of conservation concern and their habitats.

Survey and Manage

Terrestrial species thought to occur on the Deschutes National Forest included the Crater Lake Tightcoil (*Pristiloma arcticum crateris*) and the Great Gray Owl (*Strix nebulosa*). The Crater Lake tightcoil was included in a group of eight mollusk species where equivalent-effort pre-disturbance surveys were required even though it was considered a Category B species (species are considered rare, where pre-disturbance surveys are not practical) based on direction in the 2001 Record of Decision. In the subsequent 2002 Annual Species Review Memorandum (USDA and USDI 2003), the Crater Lake Tightcoil was changed from a Category B to a Category A species, where species are considered rare and pre-disturbance surveys are considered practical. The great gray owl was a Category C species which were species considered uncommon and where pre-disturbance surveys are practical. The status of the great gray owl has not changed during subsequent reviews. The Crater Lake tightcoil is included in the Sensitive Species update in the biological evaluation while the great gray owl is analyzed under the management indicator species section in the wildlife report.

On December 2009, the District Court for the Western District of Washington issued an order on partial summary judgment in favor of the Plaintiffs finding inadequacies in the NEPA analysis supporting the *Record of Decision to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl* (FS et al. 2007)(2007 ROD). The District Court did not issue a remedy or injunction at that time.

Plaintiffs and Defendants entered into settlement negotiations that resulted in the 2011 Survey and Manage Consent Decree, adopted by the District Court on July 6, 2011.

The Defendant-Intervenor subsequently appealed the 2011 Consent Decree to the Ninth Circuit Court of Appeals. The April 25, 2013 ruling in favor of Defendant-Intervener remanded the case back to the District Court.

On February 18, 2014, the District Court vacated the 2007 RODs. Vacatur of the 2007 RODs has the result of returning the Forest Service to the status quo in existence prior to the 2007 RODs.

The District Court and all parties agreed that projects begun in reliance on the Settlement Agreement should not be halted. The District Court order allowed for the Forest Service and BLM to continue developing and implementing projects that met the 2011 Settlement Agreement exemptions or species list, for three categories of projects. These categories include:

1) Projects in which any Survey and Manage pre-disturbance survey(s) has been initiated (defined as at least one occurrence of actual in-the-field surveying undertaken according to applicable protocol) in reliance upon the Settlement Agreement on or before April 25, 2013;
2) Projects, at any stage of project planning, in which any known site(s) (as defined by the 2001 Record of Decision) has been identified and has had known site-management recommendations for that particular species applied to the project in reliance upon the Settlement Agreement on or before April 25, 2013; and
3) Projects, at any stage of project planning, that the Agencies designed to be consistent with one or more of the new exemptions contained in the Settlement Agreement on or

before April 25, 2013.

Impacts Analysis:

Direct and Indirect Impacts

There will be no change from the existing condition with the implementation of the proposed action. This is an administrative change from a proposed RNA to an established RNA. There will be no activities authorized other than the establishing the RNA. Therefore, there will be no direct or indirect effects to the Crater Lake tightcoil or the great gray owl.

Cumulative Effects

Implementation of action alternative for the Designation of the Many Lakes RNA will not result in any direct or indirect adverse effects and therefore, will not result in any cumulative effects for the Crater Lake tightcoil or the great gray owl and their habitats.

Cultural Resources

No cultural resource sites or historic sites have been documented within the RNA (USDA Forest Service 2011). Establishing the RNA will have no impact to cultural resources and will not alter or limit existing Native American treaty rights. As per Section 106 of the National Historic Preservation Act, no ground disturbing activities will occur within the RNA without a cultural resources inventory.

Recreation and Access

There are no developed recreation facilities or trails within Many Lakes RNA and none will be constructed. The RNA is adjacent to the Three Sisters Wilderness Area. There is moderate use of the Deer Lake Trail along the northeast side of the RNA by mountain bikes, horse riders and hikers. There is a developed campground at Little Cultus Lake and dispersed campsites along FS Road 4636. Road 4636 provides access to three nearby trailheads in the summer and in the winter serves as a lightly used snowmobile trail. Light dispersed recreational use occurs within the RNA from day hikers and anglers. Very light impacts of recreation use are evident in the RNA, including informal trails along the shorelines of Little Cultus and Raft Lakes and light litter associated with fishing and hiking.

Under current and proposed management direction, motor vehicle use, including the use of all-terrain vehicles and snowmobiles, is prohibited within the RNA. Recreation use should not be encouraged but will be permitted as long as it does not conflict with the purpose for establishing the RNA.

Invasive Plants

There are no known invasive plant sites within the Many Lakes RNA.

Treatment of invasive plants was addressed in the Deschutes-Ochoco Invasive Plant Treatment Final EIS and Record of Decision (USDA Forest Service 2012).

Establishment of the RNA does not preclude continuation of treatment of existing invasive plant occurrences, nor would it prevent the practice of Early Detection Rapid Response (EDRR) to other invasive species, if detected within the RNA in the future. For these reasons, establishment

of the RNA is not anticipated to cause an increase in establishment or spread of invasive species.

Other Required Disclosures

Effects on Prime Farmland, Rangeland, and Forestland

There is no prime farmland, rangeland, or forestland in the proposed Many Lakes RNA area.

Floodplains and Wetlands

Executive Order 11988 sets the direction of federal actions to avoid adverse impacts associated with the occupancy and modification of floodplains. Executive Order 11990 sets the direction of federal actions to avoid adverse impacts associated with destruction or modification of wetlands. The designation of the area as RNA is not expected to have any adverse impacts to floodplains or wetlands.

Potential or Unusual Expenditures of Energy

There would be no unusual expenditures of energy with this designation. The project does not involve any forms of energy expenditure.

Conflicts with Plans, Policies, or other Jurisdictions

There would be no conflicts with plans, policies, or other jurisdictions with either alternative. All overlapping plans and policies have been evaluated for consistency. The proposal to establish an RNA in this location was developed under consultation with regulatory agencies including the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, Oregon Department of Fish and Wildlife, and the State Historic Preservation Officer.

Environmental Justice

The proposed designation does not appear to have a disproportionately high or adverse effect on minority or low-income populations, or Native American tribes. No mitigation measures to offset or ameliorate adverse effects to these populations have been identified. All interested and affected parties would continue to be involved with the comment and decision-making process.

Consumers, Civil Rights, Minority Groups, and Women

The proposed designation does not appear to have a disproportionately high or adverse effect on consumers, minorities, or women. The project would not have any effect on civil rights of any human being.

Consistency with Deschutes LRMP, as Amended

Formally designating the RNA would require amending the Deschutes LRMP. The designation is consistent with all other Forest Plan standards and guidelines. The management direction listed in Chapter 2 lists the management area categories for the Forest Plan and Northwest Forest Plan.

Chapter 4: Agencies and Persons Consulted

U.S. Fish and Wildlife Service

It was determined that there would be no effect to any Federally-listed wildlife species, therefore consultation with the U.S. Fish and Wildlife Service was not required.

State Historic Preservation Officer

Designating the Many Lakes RNA would not affect any historic or pre-historic artifacts; therefore no consultation with the Oregon State Historic Preservation Officer is required.

On March 12, 2009 a scoping letter was sent to a mailing list of interested parties maintained in the project file at the Deschutes National Forest Supervisor's Office. The following list of individuals, organizations, and agencies are receiving notice of the availability of this environmental assessment for comment:

Individuals, Agencies, and Organizations

Luann Danforth
Dave Lynn
Chuck Tolboe
Matt Mahoney
Vera Riser
Steven J. McNulty, Gas Transmission NW Corp.
Ken Roadman
Wally Buckman
Lee Fischer
Gary Pankey
Larry McGlocklin
Flip Houston, Scott Logging Inc.
Scott Odgers, Central Oregon Flyfishers
Pat Schatz, Mickey Finn Guide Service
Craig Vaage, Bigfoot Guide Service
David Nissen, Wanderlust Tours
Larry Ulrich
Ed Duffy, Deschutes County 4-Wheelers
David H. Tjomsland
Robert Speik
Susan Jane Brown
Brad Chalfant, Deschutes Basin Land Trust
Jim King
Michael Krochta
Josh Laughlin, Cascadia Wildlands Project
Karen Coulter, Blue Mountains Biodiversity Project
Doug Heiken, Oregon Wild
Glen Ardt
Marilyn Miller
Stuart Garrett, MD
Scott Silver, Wild Wilderness
Matt Kern
Mike Morris
Libby Johnson, Bonneville Power Administration
Keenen Howard
Senator Ron Wyden
Sunriver Owners Association
Dick Artley
John Pindar
Dennis Krakow, Woodside Ranch Owners Association
Arlie Holm
Fred Tanis
Chuck Burley, Interfor
Gerald Keck, D.R. Johnson Lumber Co.
John Morgan, Ochoco Lumber
Shawn Gerdes, Arnold Irrigation District
Bend Metro Parks & Recreation
Dylan Darling, The Bulletin
Billy Toman
Rick Bozarth, Bozarth's Offroad Service Specialties
Gordon Baker
Bodie Dowding, Interfor
Peggy Spieger, Oregon State Snowmobile Association
Corey Heath, Oregon Department of Fish and Wildlife
Stuart Otto, Oregon Department of Forestry

John McKenzie, Sunriver Owners Association
Mark Dunaway, Pine Mountain Observatory, Univ. of Oregon
Dyarle Sharkey
Patti Gentiluomo
Wade N. Foss
Bruce Cunningham
Moon Country Snowmobilers
Scott O'Neill
June Ramey
Mark Davis
Scott McCaulou, Deschutes River Conservancy
Ryan Houston, Upper Deschutes Watershed Council
Lynne Breese, Eastern Oregon Forest Protection Association
Greg McClarren
Rick Williams, ODOT Region 4
Kate Lighthall, Project Wildfire
SROA
Northwest Environmental Defense Center
Vicki McConnell, Department of Geology and Mineral Industries
Andy Ingram
Dean Richardson
Vic Russell
Ed Keith, Deschutes County Forester
Patricia Moore
Jim Lowrie
Jim Wilson, JTS Animal Bedding
Pieter & Diane Van Gelderen
L. Ulven
Steve Johnson, Central Oregon Irrigation District
Jim Anderson
Loren Smith
Jim Larson, Upper Deschutes River Coalition
Gail Carbiener
Margie Gregory
David Pitts
Central Oregon Climate Alliance
Kreg Lindberg
Peter Geiser
Senator Jeff Merkley
Larry Pennington, Oregon Chapter, Sierra Club
Judy Meredith, East Cascades Audubon Society
Paul Bannick, Conservation Northwest
Don Franks
Lowell Franks
Matt Bales, Mule Deer Foundation
Rod Adams, Oregon Hunter's Association
Jeff Trant
Kenna Hoyser, Central Oregon Chapter, Oregon Equestrian Trails
John Zachem
Scott Walley
Lisa Clark, Central Oregon Fire Management Service
Congressman Greg Walden
George Wuerthner
Steve Bigby
Sarah Peters, Wildlands CPR
Meriel Darzen, Oregon Ch., Sierra Club, Juniper Group
Paul Dewey, Central Oregon Landwatch
Confederated Tribes of the Warm Springs
Burns Paiute Tribe
The Klamath Tribes
USDI Fish & Wildlife Service

References

Altman, B. 2000. Conservation Strategy for Landbirds of the East-Slope of the Cascade Mountains in Oregon and Washington. Version 1.0. Oregon-Washington Partners in Flight. 81 pp.

Altman, B. and A. Holmes. 2000. Conservation strategy for landbirds in the Columbia Plateau of eastern Oregon and Washington. Version 1.0. Oregon-Washington Partners in Flight. 97 pp.

Andrews, Heather. 2010. Species Fact Sheet, Western Bumblebee *(Bombus occidentalis*). Prepared for the Bureau of Land Management/Forest Service Interagency Special Status Species Program. Portland, Oregon.

Anthony, R.G., R.L. Knight, G.T. Allen, B.R. McClelland, J.I. Hodges. 1982. Habitat Use by Nesting and Roosting bald eagles in the Pacific Northwest. Pp. 332-342 in: Transactions of the 47th North American Wildlife and Natural Resources Conference. Wildlife Management Institute, Washington, D.C.

Anthony, R.G., R.J. Steidl, and K. McGarigal. 1995. Recreation and bald eagles in the Pacific Northwest. In: R.L. Knight and K.J. Gutzwiller, eds. Wildlife and recreationists: coexistence through management and research. Island Press, Washington D.C. 372 pp.

Aubry, K.B., M.J. Crites, and S.D. West. 1991. Regional patterns of small mammal abundance and community composition in Oregon and Washington. Pages 284-294 in PNW-GTR-285, Pacific Northwest Research Station, USDA Forest Service, Olympia, WA.

Aubry, , K.G., K.S. McKelvey, and J.P. Copeland. 2007. Distribution and Broadscale Habitat Relations of the Wolverine in the Contiguous United States. Journal of Wildlife Management 71(7):2147.

Bart, J. 1995. Amount of suitable habitat and viability of northern spotted owls. Conservation Biology 9(4):943-946.

Bauer, R.D. 1979. Historical and status report of the Tule White-fronted Goose. Pp. 44-45 in Management and biology of Pacific Flyway geese (R.L. Javis and J. C. Bartonek, eds.). Oregon State University, Corvallis as cited ***In:*** Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, Oregon. 768 pp.

Beedy, E.C., and W.J. Hamilton III. 1999. Tricolored Blackbird (Agelaius tricolor). *In*: The Birds of North America, No. 423 (A. Poole and F. Gill, eds). The Birds of N. Am., Philadelphia, PA. p. 580 *In*: Marhsall, D.B., M.G. Hunter, and A. L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 768 pp.

Bingham, B. and B.R. Noon. 1997. Mitigation of Habitat Take: Application to Habitat Conservation Planning. Conservation Biology 9(4):943-946.

Boucher, Karin. 2008. Wildlife Technician, Crescent Ranger District. Personal communication regarding northern waterthrush surveys on the Crescent Ranger District.

Buchanan, J.B. 2005. Barred Owl. Pages 218–219 in Birds of Washington: status and distribution. T. R. Wahl, B. Tweit, and S. G. Mlodinow (editors), Oregon State University Press, Corvallis.

Burke, T.A., Applegarth, J.S. and T.R. Weasma, N. Duncan ed. 1999. Management Recommendations for Survey and Manage Terrestrial Mollusks. Version 2.0.

Carey, A.B. 1995. Sciurids in Pacific Northwest managed and old-growth forests. Ecological Applications 5(3):648-661.

Carey, A.B. 2000. Effects of new forest management strategies on squirrel populations. Ecological Applications 10(1):248-257.

Carey, A.B., T.M. Wilson, C.C. Maguire, and B.L. Biswell. 1997. Dens of northern flying squirrels in the Pacific Northwest. J. Wildl. Manage. 61(3):684-699.

Carey, A.B., J. Kershner, B. Biswell, and L. Dominguez de Toledo. 1999. Ecological scale and forest development: squirrels, dietary fungi, and vascular plants in managed and unmanaged forests. Wildlife Monographs 142:1-71.

Carey, A.B., W. Colgan III, J.M. Trappe, and R. Molina. 2002. Effects of forest management on truffle abundance and squirrel diets. Northwest Science, 76(2):148-157.

Carex Working Group. 2008. Vascular Plants of Many Lakes Research Natural Area. On file at Deschutes National Forest, Bend, Oregon.

Carex Working Group. 2010. Rare Plant Sighting Reports for the Deschutes National Forest Proposed Research Natural Areas. On file at the Deschutes National Forest Supervisor's Office, Bend, Oregon.

Christie, J.A. and C. Wilson. 1986. Plants of Many Lakes Research Natural Area, Deschutes County, Oregon. Plant list compiled from field visits in 1977, 1978 and 1986. On file at the Deschutes National Forest Supervisor's Office, Bend, Oregon.

Christy, Robin E., and Stephen D. West. 1993. Biology of bats in Douglas-fir forests. Gen. Tech. Report PNW-GTR-308. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 28 pp. (Huff, Mark.: Holthausen, Richard M.: Aubrey, Keith B., Tech. Cords. Biology and management of old-growth forests).

Contreras, A. 1988. Northern Waterthrush summer range in Oregon. West. Birds 19: 41-42.

Cook, F.R. 1984. Introduction to Canadian amphibians and reptiles. National Museum of Natural Science, National Museum of Canada.

Copeland, J.P. 1996. Biology of the wolverine in Idaho. M.Sc. Thesis. University of Idaho. 138 pp.

Copeland, Jeffrey P., J.M. Peek, C.R. Groves, W.E. Melquist, K.S. McKelvey, G.W. McDaniel, C.D. Long, and C.E. Harris. 2007. Seasonal Habitat Associations of the Wolverine in Central Idaho. Journal of Wildlife Management 71(7):2201-2212.

Copeland, J.P., McKelvey, K.S., Abry, K.B., Landa, A., Persson, J., Inman, R.M., Krebs, J., Lofroth, E., Golden, H., Squires, J.R., Magoun, A., Schwartz, M.K., Wilmot, J., Copeland, C.L., Yates, R.E., Kojola, I., and R. May. 2010. The bioclimatic envelope of the wolverine (Gulo gulo): do climatic constraints limit its geographic distribution? Canadian Journal Zoology 88:233-246.

Coulter, M.W. 1966. Ecology and management of fishers in Maine. Syracuse, NY: Syracuse University, University College of Forestry. Ph.D. thesis.

Courtney, S.P., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, R.J. Gutierrez, J.M. Marzluff, and L. Sztukowski. 2004. Scientific evaluation of the status of the northern spotted owl. Sustainable Ecosystems Institute, Portland, OR.

Csuti, B., A.J. Kimerling, T.A. O'Neill, M.M. Shaughnessy, E.P. Gaines, and M.M.P. Huso. 1997. Atlas of Oregon: Distribution, Habitat, and Natural History. Oregon State University Press, Corvallis, Oregon. 492 pp.

Dixon, R.D. 1995. Ecology of white-headed woodpeckers in the central Oregon Cascades. Masters Thesis. Univ. Idaho. 148 pp.

Dugger, K.M., F. Wagner, R.G. Anthony, and G.S. Olson. 2005. The relationship between habitat characteristics and demographic performance of northern spotted owls in southern Oregon. The Condor 107:863-878.

Duncan, Nancy, Tom Burke, Steve Dowlan, and Paul Hohenlohe. 2003. Survey Protocol For Survey and Manage Terrestrial Mollusk Species From the Northwest Forest Plan. Version 3.0.

Dunlap, D.G. 1955. Inter- and intraspecific variation in Oregon frogs of the genus Rana. American Midland Naturalist 54:314–331.

Dyrness, C.T., J.F. Franklin, C. Maser, S.A. Cook, J.D. Hall, and G. Faxon. 1975. *Research* Natural Area needs in the Pacific Northwest, contribution to land-use planning. USDA Forest Service, PNW Forest and Range Experiment Station, Portland, OR. General Technical Report PNW-38. 231 pp.

Earle, R.D. 1978. The fisher-porcupine relationship in Upper Michigan. Houghton, MI: Michigan Technical University. M.S. Thesis. 184 pp.

Ely, C.R. 1992. Time allocation by Greater White-fronted Geese: influence if diet, energy reserves and predation. Condor 94:857-870 *In*: Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, Oregon. 768 pp.

Engler, J., and D.C. Friesz. 1998. Draft 1998 Oregon spotted frog breeding surveys, Conboy Lake National Wildlife Refuge, Klickitat County, Washington. Unpublished Report. 5 pp.

Evans, Elaine, (The Xerces Society), Dr. Robbin Thorp (Univ. of California Davis), Sarina Jepsen (The Xerces Society), and Scott Hoffman Black (The Xerces Society). 2008. Status Review of Three Formerly Common Species of Bumble Bee in the Subgenus *Bombus.* The Xerces Society. 63 pp. Accessed at http:/www.xerces.org/wp content/uploads/2008/12/xerces_2008_bombus_status_review.pdf.

Federal Register Vol. 77, No. 46/Thursday, March 8, 2012. Announcement of a proposed rule to revise designation of critical habitat for the Northern Spotted Owl under the Endangered Species Act (ESA) of 1973, as amended.

Federal Register. 2013a. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Oregon Spotted Frog; Proposed Rule. 50 CFR Part 17.

Federal Register. 2013b. Endangered and Threatened Wildlife and Plants: Threatened Status for Oregon Spotted Frog; Proposed Rule. 50 CFR Part 17.

Frenzel, R.W. 2000. Nest-sites, nesting success, and turn-over rates of white-headed woodpeckers on the Winema and Deschutes National Forests, Oregon in 2000. Unpubl. Report submitted to the Oregon Natural Heritage Program, The Nature Conservancy of Oregon. 51 pp.

Frenzel, R.W. 2002. Nest-sites, nesting success, and turn-over rates of white-headed woodpeckers on the Winema and Deschutes National Forests, Oregon in 2002. Unpubl. Report submitted to the Oregon Natural Heritage Program, The Nature Conservancy of Oregon. 56 pp.

Frenzel, R.W. 2003. Nest-site occupancy, nesting success, and turn-over rates of white-headed woodpeckers on the Winema and Deschutes National Forests, Oregon in 2003. Unpubl. Report submitted to the Oregon Natural Heritage Program, The Nature Conservancy of Oregon. 49 pp.

Franklin, J. F., C. Frederick, C. Hall, c. T. Dyrness, and C. Maser. 1972. Federal *Research Natural Areas in Oregon and Washington: A Guidebook for Scientists and Educators.* Pacific Northwest Forest and Range Experiment Station.

Gilligan, J., M. Smith, D. Rogers, and A. Contreras. 1994. Birds of Oregon: status and distribution. *In* Marshall, M. G. Hunter, and A. L. Contreras. Eds. 2003. Birds of Oregon: A General Reference, Oregon State University Press, Corvallis, OR. 768 pp.

Guralnick, R. and B. Roth. 2013. Determination of Species Status of Terrestrial Slugs, *Deroceras*. USDA, Region 6, Portland, OR. 16 pp.

Hallock, L., and S. Pearson. 2001. Telemetry study of fall and winter Oregon spotted frog (Rana pretiosa) movement and habitat use at Trout Lake, Klickitat County, Washington. Unpublished report to Washington State Department of Transportation and Washington Department of Natural Resources Natural Areas Program. 20 pp.

Harvey, Michael J., Altenbach, J. Scott, and Best, Troy L. 1999. Bats of the United States. Published by the Arkansas game and Fish Commission in cooperation with the Asheville field Office, U. S. Fish and Wildlife Service.

Hayes, M.P. 1997. Final Report: Status of the Oregon spotted frog (*Rana pretiosa sensu stricto*) in the Deschutes Basin and selected other systems in Oregon and northeastern California with a range-wide synopsis of the species' status. Oregon Department of Fish and Wildlife. Unpublished report.

Hayes, M.P., J.D. Engler, R.D. Haycock, D.H. Knopp, W.P. Leonard, K.R. McAllister, and L.L. Todd. 1997. Status of the Oregon spotted frog (Rana pretiosa) across its geographic range. Oregon Chapter of the Wildlife Society, Corvallis, Oregon.

Hayes, M.P. and M.R. Jennings. 1986. Decline of ranid frog species in western North America: are bullfrogs (Rana catesbeiana) responsible? Journal of Herpetology 20:490–509.

Hayes, M.P., J.D. Engler, S.Van Leuven, D.C. Friesz, T. Quinn, and D.J. Pierce. 2001 Overwintering of the Oregon spotted frog (Rana pretiosa) at Conboy Lake National Wildlife Refuge, Klickitat County, Washington, 2000-2001. Final Report to Washington Department of Transportation. June 2001. 86 pp.

Hornocker, M.G. and H.S. Hash. 1981. Ecology of the wolverine in northwestern Montana. Can. J. Zool. 59:1286-1301.

Inman, R.M., K. H. Inman, A.J. McCue, M.L. Packila, G.C. White, and B.C. Aber. 2007. Wolverine space use in Greater Yellowstone. Chapter 1 in Greater Yellowstone Wolverine Study, Cumulative Report, May 2007. Wildlife Conservation Society, North America Program, Gen. Technical Report, Bozeman, Montana, USA.

Kelly, G.M. 1977. Fisher (*Martes pennanti*) biology in the White Mountain National Forest and adjacent areas. Amherst, MA: University of Massachusetts. Ph.D. thesis. 178 p.

Leonard, W.P., H.A. Brown, L.L.C. Jones, K.R. McAllister, and R.M. Strom. 1993. Amphibians of Washington and Oregon. Seattle Audubon Society, Seattle, Washington.

Lehmkuhl, J.F., L.E. Gould, E. Cazares, and D.R. Hosford. 2004. Truffle abundance and mycophagy by northern flying squirrels in eastern Washington forests. Forest Ecol. and Mgmt 200:49-65.

Lehmkuhl, J.F., K.D. Kistler, and J.S. Begley. 2006. Bushy-tailed woodrat abundance in dry forests of eastern Washington. Journal of Mammal 87(2):371-379.

Licht, L.E. 1974. Survival of embryos, tadpoles, and adults of the frogs *Rana aurora aurora* and *Rana pretiosa pretiosa* sympatric in southwestern British Columbia. Can. J. Zool. 52:613-627.

Licht, L.E. 1986. Food and feeding behavior of sympatric red-legged frogs, Rana aurora, and spotted frogs, Rana pretiosa, in Southwestern British Columbia. Canadian Field Naturalist 100:22-31.

Magoun, A. J. and J.P. Copeland. 1998. Characteristics of wolverine reproductive dens sites. Journal of Wildlife Management 62(4):1313-1320.

Maser, Z., C. Maser, and J.M. Trappe. 1985. Food habits of the northern flying squirrel (*Glaucomys sabrinus*) in Oregon. Can. J. Zool. 63:1084-1088.

Marshall, D. B., M. G. Hunter, and A. L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 768 pp.

McAllister, Kelly. Washington Department of Transportation, February 6, 2008 email

communications with Deanna Lynch, USFWS Western Washington Fish and Wildlife Office, Regarding Annual update of Oregon spotted frog species assessment.

McAllister, K.R. and H.Q. White. 2001. Oviposition ecology of the Oregon spotted frog at Beaver Creek, Washington. Unpublished report. Washington Department of Fish and Wildlife, Olympia. 24 pp.

McCallister, K.R., and W.P. Leonard. 1997. Status of the Oregon spotted frog in Washington. Draft unpublished report, Washington Department of Fish and Wildlife.

Meyer, J.S., L.L. Irwin, and M.S. Boyce. 1998. Influence of habitat abundance and fragmentation on northern spotted owls in western Oregon. Wildlife Monog. No. 139.

Mills, L.S. 1995. Edge effects and isolation: red-backed voles on forest remnants. Conservation Biology 9(2):395-403.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer.

Nussbaum, R.A., E.D. Brodie, and R.M. Storm. 1983. Amphibians and reptiles of the Pacific Northwest. University of Idaho Press, Moscow.

Oregon Department of Fish and Wildlife 2013. Wildlife Division. Wolf Program Website accessed August 12, 2014. http://www.dfw.state.or.us/wolves .

Oertley, Jill. U.S. Forest Service, September 28, 2005, email communications with Deanna

Lynch, USFWS Western Washington Fish and Wildlife Office, Regarding Oregon spotted frog – update on activities.

Oregon Natural Heritage Program. 2003. Oregon Natural Heritage Plan. Department of State Lands, Salem, OR. 167 pp.

Pacific Flyway Council. 1991. Pacific Flyway plan for the Tule greater White-fronted Goose. Pacific Flyway Study Subcomm. On the Pacific Flyway population of White-fronted Geese. Unpubl. Rep., U.S. Fish and Wildlife Service. Portland, Oregon as cited ***In:*** Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, Oregon. 768 pp.

Pearl, C.A., and M.P. Hayes. 2002. Predation by Oregon spotted frogs (Rana pretiosa) on western toads (Bufo boreas) in Oregon. American Midland Naturalist 147:145-152.

Pearl, C. A., and M.P. Hayes. 2004. Habitat associations of the Oregon spotted frog (*Rana pretiosa*): a literature review. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington In: Cushman, Kathleen A. and Christopher A. Pearl 2008. A Conservation Assessment for the Oregon Spotted Frog (*Rana pretiosa*).

Pearl, Christopher and J. Bowerman. October 5, 2005, email communications with Deanna

Lynch, USFWS Western Washington Fish and Wildlife Office, Regarding Oregon spotted frog assessment, additional remarks.

Pearl, C.A., J. Bowerman, and D. Knight. 2005. Feeding behavior and aquatic habitat use by Oregon spotted frogs (Rana pretiosa) in central Oregon. Northwestern Naturalist 86:36-38.

Pearl, C.A., M.J. Adams, and N. Leuthold. 2009. Breeding habitat and local population size of the Oregon spotted frog (Rana pretiosa) in Oregon, USA. Northwest Naturalist 90:136-147.

Pearl, C.A., and M.P. Hayes. 2004. Habitat associations of the Oregon spotted frog (*Rana pretiosa)*: a literature review. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington.

Popper, Kenneth J. 2001. Abundance and distribution of Yellow Rails in the Deschutes and Northern Great Basins of Southcentral Oregon, 2000.

Powell, R.A., and W.J. Zielinski. 1994. Fisher. Pages 38-73 in L.F. Lyon, and W.J. Zielinski, editors. American marten, fisher, lynx, and wolverine in the western United States. U.S. Forest Service Tech. Report. RM-254.

Pyle, R.M. 2002. The Butterflies of Cascadia. A Field Guide to all the Species of Washington, Oregon, and Surrounding Territories. Seattle Audubon Society. 420 pp.

Risenhoover, K.L., T.C. McBride, K. McAllister and M. Golliet. 2001. Overwintering behavior of the Oregon Spotted Frog (Rana pretiosa) along Dempsey Creek, Thurston County, Washington. Unpublished report submitted to Washington Department of Transportation, Olympia. 26 pp. + appendices.

Rombough, C.R., M.P. Hayes, and J.D. Engler. 2006. Rana pretiosa (Oregon Spotted Frog). Maximum Size. Herpetological Review 37(2):210.

Ransome, D.B. and T.P. Sullivan. 2003. Population dynamics of *Glaucomys sabrinus* and *Tamiasciurus hudsonicus* in old-growth and second-growth stands of coastal coniferous forests. Can. J. For. Res. 33:587-596.

Rosterolla, Carina. 2012. Wildlife Biologist, Crescent Ranger District. Personal communication regarding northern waterthrush survey results on the Crescent Ranger District.

Rosenberg, D.K. and R.G. Anthony. 1992. Characteristics of northern flying squirrel populations in young second- and old-growth forests in western Oregon. Can. J. Zool. 70:161-166.

Rosenberg, D.K. and K.S. McKelvey. 1999. Estimation of habitat selection for central-place foraging animals. J. Wildlife Management 63(3):1028-1038.

Rosenberg, D.K., K.A. Swindle, and R.G. Anthony. 1994. Habitat associations of California red-backed voles in young and old-growth in western Oregon. Northwest Science 68(4):266-272.

Rosentreter, R., G.D. Hayward, and M. Wicklow-Howard. 1997. Northern flying squirrel seasonal food habits in the interior conifer forests of central Idaho, USA. Northwest Science, 71(2):97-102.

Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, L. J. Lyon, W. J. Zielinski, tech eds. 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine in the Western United States. Gen. Tech. Rep. RM-254. Ft. Collins, CO: USDA, FS, Rocky Mountain Forest and Range Experiment Station. 184p.

Schuller, R. 2008. Many Lakes Research Natural Area Plant List. Compiled from RNA guidebook supplement, and 1993, 1998, 1999, and 2003 field observations. On file at the Deschutes National Forest Supervisor's Office, Bend, Oregon.

Saab, V.A. and J.G. Dudley. 1998. Responses of cavity-nesting birds to stand-replacement fire and salvage logging in ponderosa pine/Douglas-fir forests of southwestern Idaho. Res. Pap. RMRS-RP-11. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. 17 p.

Saab, V.A., R. Brannon, J. Dudley, L. Donohoo, D. Vanderzanden, V. Johnson, and H. Lachowski. 2002. Selection of fire-created snags at two spatial scales by cavity-nesting birds. Gen. Tech. Rep. PSW-GTR-181. Pacific Southwest Research Station, USDA Forest Service. 14 pp.

Smith, F.A. 1997. Neotoma cinerea. Mammalian Species 564:1-8.

Stalmaster, M. 1987. The Bald Eagle. Universe Books, New York, NY. 227 pp.

Tallmon, D. and L.S. Mills. 1994. Use of logs within home ranges of California red-backed voles on a remnant of forest. Journal of Mammalogy 75(1):97-101.

Tattersall, G.J. and G.R. Ultsch. 2008. Physiological ecology of aquatic overwintering in ranid frogs. Biological Reviews 83:119-140.

Thomas, J.W., E.D. Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A conservation strategy for the northern spotted owl. Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl. U.S. Forest Service, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and U.S. National Park Service, Portland, Oregon.

Thysell, D.R., L.J. Villa, and A.B. Carey. 1997. Observations of northern flying squirrel feeding behavior: use of non-truffle food items. Northwestern Naturalist 78:87-92.

USDA Forest Service. 1990a. Land and Resource Management Plan. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 1990b. Final Environmental Impact Statement, Land and Resource Management Plan. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 1996. Cultus and Sheridan Late Successional Reserve Assessment. Deschutes National Forest. Bend, Oregon.

USDA Forest Service. 2010. Establishment Record for Many Lakes Research Natural Area within the Deschutes National Forest, Deschutes County, Oregon. Deschutes National Forest. Bend, Oregon.

USDA (Forest Service). 1996. Deschutes National Forest Memo on Northern Spotted Owl Dispersal Habitat. File Code 2670.

USDA. 2008. Johnson's Hairstreak Butterfly and Dwarf Mistletoe Backgrounder. USDA Forest Service, LaGrande, OR. 8 pp.

USDA Forest Service. 2000. Forest Service Landbird Strategic Plan. Washington, D.C. U.S. Forest Service.

USDA Forest Service. 2011. A Cultural Resource Overview of the Deschutes/Ochoco RNA Projects. Heritage Stewardship Group. Bend, Oregon.

USDA Forest Service. 2011. Update of the Regional Forester's Sensitive Species Lists and Transmittal of Strategic Species List. Region 6, Portland, OR.

USDI (U.S. Fish and Wildlife Service). 1992. Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service. Portland, Oregon.

USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDA Forest Service. 2008. Methodology for estimating the number of northern spotted owls affected by proposed federal actions. Version 2.0. Oregon Fish and Wildlife Office, Fish and Wildlife Service, Portland, OR.

U.S. Fish and Wildlife Service. 2008. Birds of conservation concern 2008. Division of Migratory Bird Management, Arlington, Virginia. 99 pp. [Online version available at http://migratorybirds.fws.gov/reports/bcc2008.pdf].

USDI (U.S. Fish and Wildlife Service). 2009. Rocky Mountain Wolf Recovery 2009 Interagency Annual Report. C.A. Sime and E. E. Bangs, eds. USFWS, Ecological Services, Helena, Montana. http://westemgraywolf.fws.gov

USDI (U.S. Fish and Wildlife Service). 2011. Revised Recovery Plan for the Northern Spotted Owl, (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service, Portland, Oregon. Xvi+258 pp.

Warren, A.D. 2005. Butterflies of Oregon: Their Taxonomy, Distribution, and Biology. Lepidoptera of North America 6. Contributions of the C.P. Gillette Museum of Arthropod Diversity. Colorado State University, Fort Collins, CO. 408 pp.

Waters, J.R. and C.J. Zabel. 1995. Northern flying squirrel densities in fir forests of northeastern California. Journal of Wildlife Management 59(4):858-866.

Waters, J.R., K.S. McKelvey, C.J. Zabel, and D. Luoma. 2000. Northern flying squirrel mycophagy and truffle production in fir forests in northeastern California. Gen. Tech. Rep. PSW-GTR-178. Arcata, CA. USDA Forest Service, Pacific Southwest Research Station.

Watson, J.W., K.R. McAllister. D.J. Pierce, and A. Alvarado. 2000. Ecology of a remnant population of Oregon spotted frogs (*Rana pretiosa*) in Thurston County, Washington. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington.

Watson, J.W., K.R. McAllister, D.J. Pierce. 2003. Home ranges, movements, and habitat selection of Oregon spotted frogs (*Rana pretiosa*). Journal of Herpetology 37(2):292-300.

Wisdom, M.J.; S. Richard; B.C. Wales; et al. 2000. Source habitats for terrestrial vertebrates of focus in the interior Columbia basin: broad-scale trends and management implications. Volume 2-Group Results. Gen. Tech. Report PNW-GTR-485.

Xerces Society. 2012. Accessed at www.xerces.org (accessed 2/24/12)

Zabel, C.J., J.R. Dunk, H.B. Stauffer, L.M. Roberts, B.S. Mulder, and A. Wright. 2003. Northern spotted owl habitat models for research and management application in California. Ecological Applications 13(4):1027-1040.