Oregon Natural Areas Plan

2015

Oregon Parks and Recreation Department

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Lisa Sumption, OPRD Director

This is the second Oregon Natural Areas Plan,
and the first plan developed under the auspices of OPRD.
It is based on the 2010 Natural Areas Plan published by the State Land Board,
which was based on the Oregon Natural Heritage Plan, first published in 1981,
and revised in 1988, 1993, 1998 and 2003 by the Natural Heritage Advisory Council.

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CHAPTER 1. INTRODUCTION

The rich diversity of ecosystems and native plants and animals found in Oregon is one of the state's most distinct and valued qualities. Oregon has rain forests, pine savannas, oak woodlands, alpine meadows, prairies, deserts, marshes, estuaries, dunes, rocky headlands, lakes and streams.

There are many reasons it is so diverse. There are climate extremes, with rainfall ranging from over 200 inches a year along Oregon's north coast, to less than 7 inches a year in the Alvord Desert, and temperatures from the very mild banana belt along the coast near the California border to the extremes of the high alpine areas of the Wallowa Mountains. Oregon is exceptionally diverse geographically and geologically, having ancient serpentine landscapes in the Siskiyou and Blue Mountains, recent volcanics in the Cascades and the deepest gorge in North America at Hells Canyon. And lastly, Oregon is a floristic crossroads, with arctic boreal species finding their southern limit, Rocky Mountain species common in northeastern Oregon, Great Basin species in southeastern Oregon and California coastal and Sierra species in the southwest, all mixing with native northwestern taxa to create a wide array of habitats.

Natural Areas

Natural Areas protect many high quality native ecosystems and rare plant and animal species. Valued for teaching and scientific research, Natural Areas provide a relatively undisturbed setting in which to study native ecosystems and species. Research projects on these sites provide important answers to statewide land management questions. Native forests, grasslands, tide pools, bogs, and sagebrush steppe are a few of the diverse ecosystem types protected in Oregon's Natural Areas, as are many of Oregon's rarest plants and animals.

The Oregon Natural Areas Program is a member of the Natural Areas Association, a non-profit which supports state natural area programs and the community of natural area professionals across the country. The Oregon Natural Areas Program is also a member of and partner with the Pacific Northwest Interagency Research Natural Areas Committee.

Oregon Natural Areas Program History

The Oregon Natural Areas Program was established by the 1979 Legislature in the Natural Heritage Act (ORS 273.561-.591 [SB 448]), to help protect natural areas in Oregon. The law was based on a tradition of natural area inventory and conservation. In 1973 the Legislature passed the Natural Area Preserves Act, which was the first attempt to conserve state natural areas. In 1972 scientists and conservationists led by Jerry Franklin of the U.S. Forest Service's PNW Research Station developed the first *Research Natural Area Needs in the Pacific Northwest* (Franklin et al. 1972). This publication served to guide the establishment of federal natural areas in Oregon until the publication of the first Oregon Natural Heritage Plan in 1981.

After 1979, the Oregon Natural Heritage Program (now the Oregon Biodiversity Information Center or ORBIC) staff, along with the Natural Heritage Advisory Council, guided the establishment of natural areas in Oregon with very limited state resources. For the first 14 years of the program all of the work to establish natural areas was done cooperatively with the Interagency Research Natural Areas committee, an Oregon – Washington partnership staffed by the PNW Research Station. The natural areas program grew and flourished on federal lands. During this time, no natural areas were established on any state lands in Oregon. After 1993, the Oregon Parks and Recreation Department (OPRD) became the first and only state agency to establish new natural areas. OPRD has since established 8 state park natural areas, and is continually evaluating and acquiring new sites.

The 25-year review of the Oregon Natural Heritage Act and Natural Heritage Program affirmed that natural areas continue to provide important places for public education and baseline research and that it remains important for Oregon to maintain a natural areas program. The review resulted in the Oregon Legislature updating the law by moving management of the program to the Oregon Parks and Recreation Department in 2012. A description of the new program, rules, goals and responsibilities are outlined in this plan.

Goals of the Natural Areas Program

There are three primary goals and three additional principles directing the activities of the Natural Areas Program. The goals are to:

1. Create a discrete and limited system of natural areas representing the full range of Oregon's natural resources. These areas are to be used for scientific research, education and nature interpretation.

2. Establish a method for public and private sector voluntary cooperation in the development of a system of natural areas.

3. Provide advice to managers of natural areas on the management and conservation of natural resources within Oregon.

The program's activities are based on the following principles:

1. The Program shall be complementary to and consistent with the Federal Research Natural Area program.

2. All conservation shall be voluntary on the part of the landowner or public land manager.

3. Wherever feasible, natural area establishment should not conflict with economic uses or development.

Natural Areas Plan

The Natural Areas Plan guides the selection of natural areas in Oregon. As a first step, the Plan defines the full range of components of Oregon's biological resources – the terrestrial, marine, wetland, and aquatic ecosystems that define Oregon's living landscape. Unique geologic formations are included because of their special scientific and educational interest.

In addition to these natural resources, the Plan calls out "special species", including vascular plants, non-vascular plants, vertebrates, and invertebrate animals that are currently considered to need attention so as not to disappear from Oregon.

Since so many lands in Oregon have natural values which may be important for conservation, criteria are needed to identify those areas with the highest or most natural values. The Plan provides landowners and public land managers with tools to voluntarily designate and protect priority areas, and assistance on how to manage these lands. Guidelines for the management of these conservation areas are consistent with those developed for the Research Natural Area program on federal lands.

There is no requirement to update the Oregon Natural Areas Plan under law or administrative rule. However, it is anticipated that the plan will be updated every five years to include new scientific concepts related to natural areas, to remain useful to state and federal land management planning, and to evaluate the effectiveness of the program.

Interagency Strategy for the Pacific Northwest Natural Areas Network

In 2009, the Interagency Research Natural Areas committee published a strategic plan for the Natural Areas Program in Oregon and Washington (Wilson et al. 2009). Much of this document is incorporated directly into the Plan, including the vision statements identified in each of the strategy chapters.

Key Terms and Definitions

The following terms are used in this Plan:

Aquatic and Wetland Ecosystems -- Distinct freshwater aquatic environments, equivalent to "Aquatic Types" as used in the Oregon Natural Heritage Act; and Wetlands and Deepwater habitats, as defined by the U.S. Fish and Wildlife Service (Cowardin et al. 1979). This category includes wetlands, streams, rivers and lakes. Marine and Estuarine aquatic ecosystems are treated separately.

Biodiversity -- The full range of variety and variability within and among living organisms and the ecological complexes in which they occur. This encompasses ecosystem processes, species diversity and genetic variation.

Ecoregion -- A geographic area with characteristic features such as climate, geology, geomorphology, soils, ecosystem processes, and natural assemblages of plants and animals.

Ecosystem -- An assemblage of organisms plus the local environment supporting them. These generally have consistent dominant species, food chains, and nutrient flows. Ecosystems in the Plan can vary in area from a 20 acre silver sagebrush dominated vernal pool community to a 20,000 acre wetland complex.

Geologic Formations -- The rocks and sediments deposited in distinct environments (formations) or the landforms formed by distinct biological, chemical, and/or physical processes (features). These features or formations are grouped into types that indicate when they were formed or deposited.

Invasive Species -- Also referred to as exotic species, these are plants or animals occurring in Oregon as a result of introduction or unnatural range expansion. These are species that disrupt natural ecosystem processes and did not occur in Oregon before statehood.

Native Species -- Any species known to occur in Oregon before statehood or that has moved into Oregon through natural range extension.

Natural Area -- An area of land or water managed for scientific research and education, containing important biological or geological attributes.

Natural Heritage Resources -- The Terrestrial Ecosystems, Aquatic and Wetland Ecosystems, Special Species and Geological Formations included in the Natural Areas Plan.

Oregon Register of Natural Heritage Resources -- A registry maintained by the Natural Areas Program of significant natural areas, voluntarily managed in ways that protect one or more natural heritage resources.

Representation -- The inclusion of a species or ecosystem type in a natural area. Ahe central goal of the Heritage Program is to assure that all species and ecosystems are adequately represented, but without unnecessary duplication.

Research Natural Area (RNA) – Natural areas established by federal agencies under the plan of the Pacific Northwest Research Natural Area Committee. The Oregon Natural Areas Program is, in effect, the state counterpart of the federal program.

Special Species -- Animal and plant species considered to be of conservation interest because of their rarity or vulnerability to extirpation or extinction, or because they are under-represented in the statewide system of protected natural areas.

Terrestrial Ecosystems and Plant Associations – Assemblages of land-based species in a given locale, usually with a consistent set of dominant species and a characteristic environment. These are largely equivalent to “Plant Associations” as defined in the National Vegetation Classification System (Jennings et al. 2008). They more accurately reflect all components of the ecosystem rather than merely the dominant plant species.

Dixie Butte Research Natural Area

CHAPTER 2. DESIGNING A NATURAL AREA NETWORK

Vision

A network of natural areas is designed to include the full diversity of ecosystems, species and geologic features in Oregon, which complements other natural areas in the Pacific Northwest, while recognizing that each site is a dynamic ecosystem that will change over time.

Ecoregional Approach

Ecoregions are areas with similar climate, vegetation, geology, geomorphology, soils, and ecosystem processes. Ecoregions generally have characteristic vegetation and species. Oregon has used ecoregions as a way to evaluate environmental health in the *State of the Environment Report* (2000) and to plan for conservation in the Oregon Department of Fish and Wildlife's *Conservation Strategy* (2015). Also, the Oregon Watershed Enhancement Board uses these Ecoregions to identify conservation acquisition priorities. The Natural Areas Plan uses ecoregions (Figure 1) to define the different types of natural areas needed for research and education.

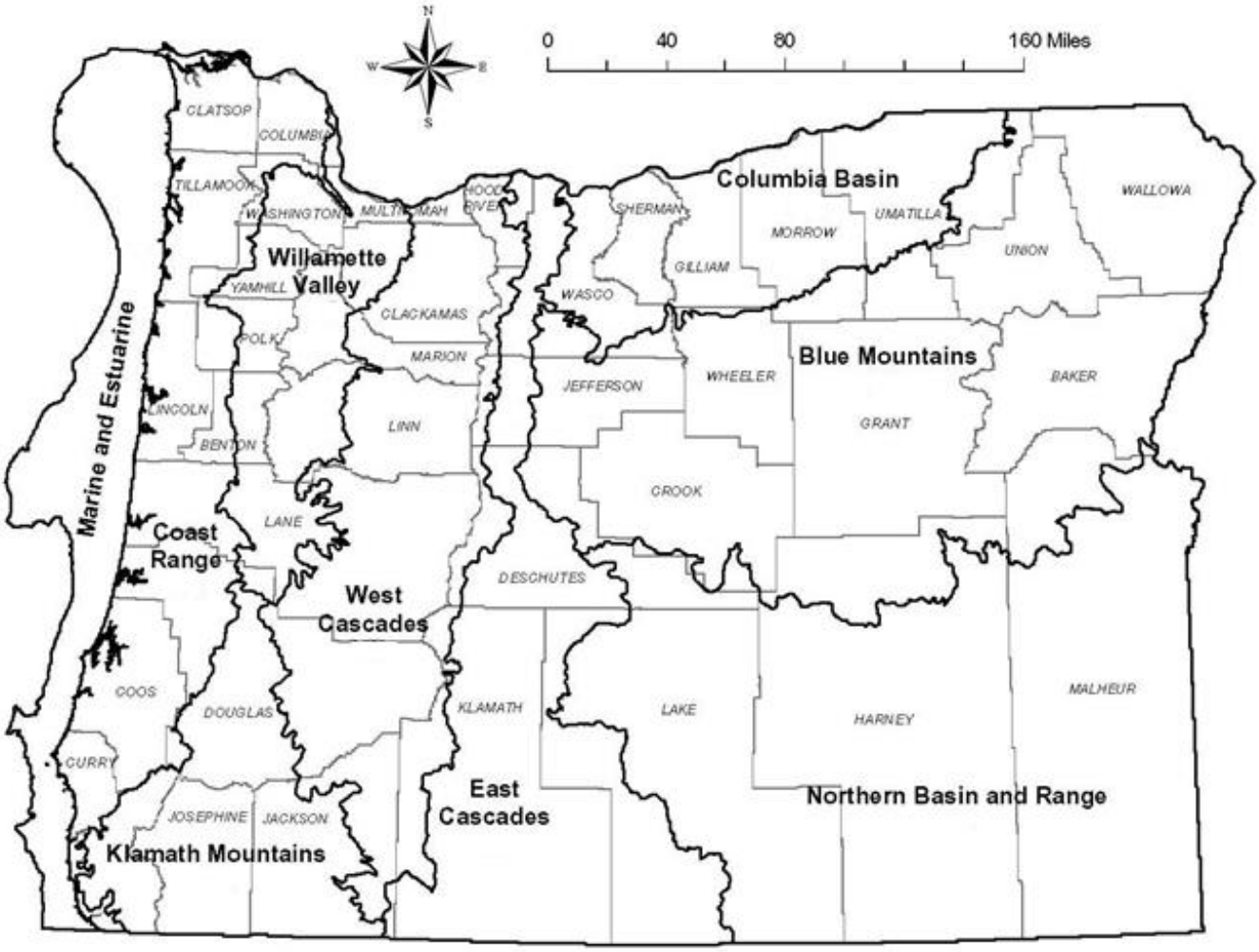


Figure 1. Ecoregions of Oregon used in this Natural Areas Plan.

Currently, Oregon recognizes eight terrestrial ecoregions in Oregon, based on the map developed by the EPA (Thorson *et al.* 2003), modified from the USFS ecoregions (Bailey 1995). The EPA map includes a small part of a ninth ecoregion in Oregon, the Snake River Plains which is combined with the Basin and Range Ecoregion for this Plan, since the area found in Oregon is so small. A Marine - Estuarine region covering the intertidal areas, coastal habitats and bays that is not in EPA's map is included as well. A brief description of each ecoregion's ecology, geology, and economy is included at the beginning of each ecoregion chapter.

Ecosystems, Geologic Formations and Species in Natural Areas

Oregon's natural diversity consists of thousands of plants and animals interacting with each other and with their physical environment. The natural area network is designed to include examples of all of these to assure at least one good example of each ecosystem type, geologic formation and at-risk species is represented in each ecoregion in which they naturally occur. How these ecosystems, formations and species are characterized and identified as needing representation is the basis of this chapter.

An ecosystem type is generally a plant association, such as a Douglas-fir forest, a big sagebrush / bunchgrass shrubland, prairie or a sphagnum bog. The comprehensive list of ecosystems from Oregon make up the major part of the natural area design. If a comprehensive list of all species which occur in the complete list Oregon's terrestrial and aquatic plant associations were compiled, the list would contain almost all of Oregon's native species.

However, some individual species (such as the Willamette Valley daisy or the pygmy rabbit) are rare or occur only locally. Because these species may not be protected using the ecosystem approach alone, the Natural Areas Program identifies them as special species and works to assure they are represented in the natural areas system.

Ecosystems and Plant Associations

The ecological units in the Natural Areas Plan are plant associations from the International Vegetation Classification System (IVCS - Jennings et al. 2008). The Oregon Biodiversity Information Center was one of many programs that helped develop this classification, which is now on the NatureServe Explorer web site (http://natureserve.org/explorer). The IVCS defines a plant association as "*a vegetation classification unit defined on the basis of a characteristic range of species composition, diagnostic species occurrence, habitat conditions, and physiognomy*." The Oregon Biodiversity Information Center maintains a complete list of plant associations known from Oregon, available at http://orbic.pdx.edu/documents/pclist_2004.pdf, along with information on their state and federal status. Descriptions of most of these associations are also available on NatureServe Explorer.

Only terrestrial, wetland and riparian vegetation types are included in the IVCS. For estuaries and marine ecosystems, the plan has adopted NOAA's Coastal and Marine Ecological Classification Standard (FGDC 2012). State agencies are attempting to implement this in Oregon, and it was used as the basis for as many of the types in our new Marine-Estuarine Ecoregion as was possible. Unfortunately, no classification has yet been adopted for freshwater aquatic ecosystems, so these types are only occasionally included in the plan. This represents an area of research that should be addressed in the near future.

For simplicity, all ecosystem types – terrestrial, aquatic and marine – will be referred to as plant associations throughout the remainder of this plan. This does not alter the fact that only wetland, terrestrial and riparian vegetation types have defined plant associations to date.

Identifying Ecosystem Objectives

Oregon's plant associations or ecosystems are included in the Natural Areas Plan when:

1. They have been defined in the literature or proposed by scientists or managers and have historically occurred in Oregon.

2. They represent unique or local ecosystems which significantly contribute to the biodiversity of an ecoregion.

Because plant associations typically occur in clusters, several can often be found in a mosaic together. As a result, the number of natural areas needed to protect ecological resources is significantly smaller than the number of plant associations in an ecoregion.

Various scientific references were consulted to develop the resource lists in the plan. All major sources are included in the bibliography, which is based on an updated comprehensive collection of scientific literature maintained at the Oregon Biodiversity Information Center. In addition, experts from the region's universities and natural resource agencies as well as knowledgeable individuals were consulted.

Assigning Ecosystem Priorities

Plant associations are ranked in the ecoregion ecosystem lists as high (H), medium (M) or low (L) priority. The primary factor in determining an ecosystem priority is the difficulty of finding ecosystem representation for the type. Four factors help characterize this: 1) **rarity** of known, high quality examples; 2) **threat** to the occurrences of the type; 3) the **ecological fragility** or sensitivity to natural or artificial disturbances; and 4) the **adequacy and viability of protected occurrences**.

The Oregon Biodiversity Information Center uses these same criteria to rank all ecosystem types and species found in Oregon. This ranking system is used by Natural Heritage Programs across the U.S. and is maintained by NatureServe, and ranks species and ecosystems at a global and state basis.

The global ranks vary from G1 to G5, using the four criteria listed above. G1 ranked species are critically imperiled, while species ranked G5 are demonstrably secure. Plant associations and native species are also ranked based on their status within Oregon, using the same numbering system. State ranks range from S1 to S5, with S1 including types critically imperiled in Oregon and S5 applied to those demonstrably secure Oregon.

The priority ranking for plant associations in the Natural Areas Plan is determined by its NatureServe / Natural Heritage rank. The priority values are assigned as follows:

High Priority	=	G1, G2 or S1 ranked types
Moderate	=	G3, S2 or G4S3 ranked types
Low	=	Ranks lower than above

Currently plant associations are only ranked at the state and the global level, and there is no available data to rank them at the ecoregional scale. While ecoregional ranking would better inform the ecoregional priorities in this plan, data availability requires the state and global data be used.

Adequate Representation of Types

To allow for study and education of the full range of Oregon's diversity, the natural areas network must contain examples of each identified ecosystem type or plant association that are of sufficient size and quality. The natural area designation must also provide sufficient protection of the ecosystem types. Three basic criteria are used to decide if an example of an ecosystem type is adequately conserved within a natural area.

1. Management Intent - Sites are adequately protected if the existing management plan or agency management direction identifies the long-term survival of the ecosystem and its protection from human impacts as primary goals.

2. Quality - A determination should be made that the occurrence of the ecosystem or plant association is large enough and of sufficient quality for research and educational uses.

3. Size – Sometimes, ecosystems or species are so rare that the only occurrences that exist on a natural area are small. In these cases, having partial representation at more than one site is the only way for the public to see them or researchers to study them.

Terrestrial Ecosystem Types

Terrestrial ecosystem types are the most frequently observed plant associations. They are organized in the ecoregion lists by zone, with the zones generally representing the dominant plant species in the canopy. These forest zones were modified from the *Yellow Book* (Dyrness et al. 1975) which defined the first list of natural area needs for the Pacific Northwest. Adjacent zones containing only a few ecological communities have been combined in certain ecoregions to simplify the plan.

There are three types of aquatic and wetland ecosystems described in this plan: lakes and ponds (lacustrine); wetlands and bogs (palustrine) and rivers and stream (riverine).

Lacustrine includes lakes larger than 20 acres (8 hectares) and deeper than 6.6 feet (2 meters). Aquatic floating plants and lakeshore marshes are considered lacustrine types. The PSU Center for Lakes and Reservoirs has the best database of lakes

and aquatic weeds and has developed an on-line version of the *Atlas of Oregon Lakes* (Johnson 1985, http://aol.research.pdx.edu/).

Palustrine types are freshwater or alkaline wetlands dominated by emergent trees, shrubs, grasses, sedges, forbs, mosses or liverworts. The Oregon Department of State Lands manages the state wetland program to conserve these resources. They include small (non-lacustrine) lakes, ponds and springs, as well as intermittent lakes, vernal ponds and playas. Riparian areas associated with the immediate margins of rivers and streams are included here. Wetlands have been a major focus of classification and inventory in Oregon, included in the IVCS and linked to the U.S. Fish and Wildlife Service's Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et al*. 1979), the standard for wetland mapping in the United States.

Riverine resources represent aquatic types associated with rivers and streams. In the 1981-1993 editions of the plan, riverine resources were identified as a third freshwater aquatic category. However, since there are no standard classifications available to adequately define riverine types, they are no longer included in the ecoregional lists. When new research by natural resource agencies, non-governmental organizations or universities leads to a somewhat comprehensive classification or map of aquatic ecosystems in Oregon, they will be included in the plan.

Marine and Estuarine Ecosystems

All marine and estuarine ecosystem types are found in the Marine and Estuarine Ecoregion. The classification employed is described in detail in the Marine and Estuarine chapter.

Marine resources include tidal and subtidal habitats with little or no freshwater dilution. They currently extend past the area that Oregon controls, three nautical miles seaward of the coastal baseline, to the edge of the continental shelf (Figure 2).

Development of policy for management and designation of marine reserves is overseen by the Ocean Policy Advisory Council (OPAC), and its *State of Oregon Territorial Sea Plan* (1994). The state and OPAC continue to work to establish various marine reserve types.

Estuarine resources are tidal and subtidal waters with occasional to regular freshwater dilution. They extend from the outer limits of open to temporarily enclosed embayments to a point upstream where the effects of ocean-derived salts are negligible. Estuarine resources are well catalogued in the *Oregon Estuary Plan Book*, developed cooperatively by the Oregon Department of Fish and Wildlife and the Oregon Department of Land Conservation and Development (1987).

Geologic Formations or Features

Oregon's geological heritage consists of rocks, sediments and associated features representing the richness of Oregon's natural heritage. For example, there are Jurassic shales with finely ornamented ammonites in the Blue Mountain and Klamath Mountain Ecoregions; spectacular Tertiary flood basalts that extend across the 300 mile-width of Oregon from the Columbia Basin Ecoregion to the Marine and Estuarine Ecoregion; explosive, volcanic deposits and features, such as Crater Lake of the Cascades Ecoregion; as well as the Quaternary deposits and features such as the striking, glacial erratics transported from the Rocky Mountains by icebergs during ice-age floods and deposited in the Willamette Valley.

The rocks, sediments, and features of Oregon’s geology formed in distinct environments or the surface features were sculpted by distinct biological, chemical, and physical processes. These rocks, sediments and features can be defined as geological formations and features. **Formations** represent rocks found in the standard intervals of geologic time, usually on the order of millions to tens of millions of years.

In the Plan these intervals extend from the Devonian (the time interval from about 410 to 355 million years ago) that includes the oldest rocks yet found in Oregon, through the Quaternary, which includes the present time. **Features**, represent deposits or geomorphic forms whose character has developed over the past two million years (the Holocene time interval) and may be undergoing change today, such as the Netarts Spit.

These geological types are similar to the ecosystem types in that for the most part, they consist of distinctive assemblages. They differ in that they are organized by time interval. Furthermore, even

though there are similar time intervals among the different ecoregions, the geological setting and processes that formed the deposits of rock and sediment of the intervals were usually different. For example, in one ecoregion Tertiary rocks may have formed on land whereas in another ecoregion, the Tertiary rocks may have formed in the sea. As a result, the geological features and formations are both distinct and characteristic in each ecoregions.

There are two main guidelines for including geological features and formations in the list of Geologic Types:

1. Certain geologic types, for instance fragile volcanic features and paleontological sites, are vulnerable to destruction and can be protected by effective natural area management.

2. Other geological types are a prominent component of our natural heritage and should be recognized for their educational and interpretive values. This could be accomplished through recognition of the finest features on the State Register of Natural Resources.

The Natural Areas Program functions to both formally recognize the geologic formations and features and to help protect them through natural area conservation. As is the case for species and ecosystems, priorities for protection or representation are based on the presence of a potential or actual threat to the formation or feature, as well as the rarity and/or the significance of the formation or feature. Geologic types are included in a list for an ecoregion if its occurrences are endemic to, representative of or particularly important in the ecoregion.

A geologic type may not require inclusion in a formally designated natural area for it to be considered protected. For instance, geological values are an important factor in the management of many areas designated for recreation, such as Wild and Scenic Rivers, Wilderness Areas, or State and National Parks. However, some geological features, such as fossil locales or ash flows, can be quite sensitive to disturbance. In these areas, the use of designations designed to represent ecosystems and species is desired.

Assigning Priorities to Geologic Features and Formations

Geological features and formations are prioritized in the ecoregional list of natural area needs as high (H), medium (M) or low (L) priority. The factors used for assessing geologic elements are somewhat different than the ecological types. The primary factors include the: 1) **rarity** of known, high quality occurrences of the geologic element; 2) **threat** to the occurrences of the type; and 3) **fragility** or sensitivity to natural or artificial disturbances.

Special Species

In addition to ecosystem and geologic types, the natural areas program strives to include all native plants and animals in the ecoregional network of natural areas. Since natural areas selected for ecosystems will likely contain examples of the common species, the plan identifies lists of rare and at-risk species, or “special species” that should be included either in a registered or designated natural area if possible.

The Natural Areas Program works with the Oregon Biodiversity Information Center, as well as the Oregon Department of Fish and Wildlife and the Oregon Department of Agriculture, to develop a comprehensive list of special species that need to be included in the Natural Areas Plan. The species included in ecoregional lists were selected using the most current information available on the distribution and abundance of plant and animal species native to Oregon. The list of taxa in the plan should assist public and private land managers and planners in determining which species are of special concern within their given management jurisdictions. They are also intended for use by amateur and professional botanists and zoologists to help focus their efforts on those taxa most in need of attention.

Species are listed within the ecoregions where they naturally occur, and in the protected areas that support them. Only those taxa which are considered to be threatened or endangered in Oregon or throughout their range have been included.

Special Species List Designations

List 1 contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders. They can be very significant when protecting the genetic diversity of a taxon. Extreme rarity is viewed as a significant threat and as such very rare Oregon taxa are all on this list.

The Oregon Biodiversity Information Center tracks all occurrences in Oregon for any species included on List 1 and List 2, and has a fairly comprehensive database of their locations.

The Oregon Biodiversity Information Center also maintains two other lists of at-risk species: List 3 and List 4. List 3 is the "Review List", which includes taxa that could be threatened or endangered, but whose status is currently unclear. List 4 is the "Watch List" of taxa that are rare but apparently stable, or those that are declining but remain too abundant currently to be considered threatened. Taxa on Lists 3 and 4 have not been included in the Natural Areas Plan because they are at lower risk, and because their distributions may not be understood well enough to include them.

The comprehensive list of these taxa and the most up-to-date information on their distributions can be found in the most recent edition of *The Rare, Threatened and Endangered Species of Oregon* (ORBIC 2013), available at http://orbic.pdx.edu/rte-species.html.

Tufted puffin, by Roy Lowe

CHAPTER 3. NATURAL AREA CONSERVATION

Vision

Federal agencies, state agencies, local governments and conservation organizations working together to designate a network of natural areas representing the full diversity of ecosystems in Oregon.

Oregon's natural areas are conserved when landowners or land managers choose to establish a natural area on lands they own or manage. Natural areas can also be permanently protected if a conservation group, state or federal agency buys private land to conserve it. More commonly, it occurs when a state or federal agency designates a site as a natural area in an agency plan. The federal and state agencies rely on different mechanisms, depending on the laws and rules that guide their actions. Descriptions of the agency designations and natural area programs are included in this chapter. In addition this chapter discusses different mechanisms for establishing natural areas and outlines various public and private land management designations which together create the statewide system of natural areas.

Natural areas can be conserved voluntarily on private lands, either on a short term basis by an interested landowner, or through a conservation agreement or easement, which has a set time span. Efforts to make it easier for landowners to conserve habitats on their lands and to provide incentives for landowners to restore habitats on private lands have been increasing and are an important focus for the conservation efforts outlined in the Oregon Conservation Strategy. A comprehensive list of incentives for voluntary protection of private lands is in the 2015 update of the strategy, available at: http://www.dfw.state.or.us/conservationstrategy/. While these are important for conservation overall, the history of the natural area program in Oregon has shown that voluntary conservation by private landowners has not been an effective method for establishing natural areas..

In Oregon, the majority of natural areas have been established by the Bureau of Land Management and the U.S. Forest Service on federal lands. So, the primary partner in establishing and managing natural areas is the Pacific Northwest Interagency Natural Area Committee which works with the federal agencies to establish federal Research Natural Areas (RNAs) on public lands.

The Pacific Northwest Interagency Natural Areas Committee works with the Natural Area programs in Oregon and Washington to help implement the states' natural area plans and cooperatively create vision and momentum for the use of natural areas.

The process for establishing natural areas is different for federal, state and private lands in Oregon, and are described below. Regardless of the owner, for a site to be designated as a natural area in the state, three steps need to be taken:

1. Search databases and literature at the Oregon Biodiversity Information Center, university libraries, herbaria and other information sources, and contact experts in the scientific and professional community to determine if the site contains species or plant associations needing representation.
2. Visit the site to evaluate the size and quality of the ecosystem types present.
3. Make a recommendation to the appropriate oversight group that the area be designated.

Oregon State Agency Natural Area Establishment and Designation

Dedication is the primary way natural areas are protected on state lands. The Natural Areas Act states that "the Oregon Transportation Commission, the State Fish and Wildlife Commission, the State Board of Forestry, the State Board of Higher Education, the State Parks and Recreation Commission and the State Land Board shall, with the advice and assistance of the department, establish procedures for the dedication of state natural areas on land, the title of which is held by the State of Oregon, and which is under that agency's management and control." These established or dedicated sites would be called State Natural Areas.

State agencies can choose to conserve a natural area based on internal staff recommendations, or they can proceed from a recommendation from the Biodiversity Information Center or the Interagency RNA Committee. Model dedication procedures or guidelines for dedication are included as Appendix 1 to assist natural resource state agencies in establishing natural areas on their lands. Agencies may wish to further refine these guidelines.

In addition to dedication, state agencies can either receive gifts of private property or acquire private property to be managed as natural areas. The Natural Areas Act clearly states that whenever feasible, areas selected for protection "shall be located on lands which have been allocated primarily to special non-commodity uses." Only properties that have ecosystems, species or geologic features or formations included in this natural areas plan and are suitable for dedication should be dedicated as a state natural area.

While natural areas that are dedicated on state lands are assumed to be permanently protected, there are procedures that allow for the Natural Area designation to be removed, or "terminated". In order to terminate a dedication, the agency must first hold a public hearing. There must be adequate public notice and a finding from the hearing that either: (1) there is an "imperative or unavoidable necessity;" or (2) the dedication of the site is no longer needed according to the guidelines of the Natural Areas Plan. Reasons to remove dedication might be that the ecosystem types or species that were the basis for designation are no longer present, or another larger or better quality site has been found which better represents them; plus compelling reasons exist to no longer manage the lesser site as a natural area. To date, no state dedicated natural areas have been terminated, although a portion of one BLM RNA was removed when a landslide from upstream mine tailings buried the riparian vegetation the site was designated to protect, and other properties changed hands, at which time the designation was dissolved.

Federal Agency Natural Area Establishment and Designation

Federal agencies have different protocols for establishing natural areas (Research Natural Areas or RNAs) on their lands. Generally federal agencies identify areas which contain unrepresented plant associations, species or geologic types identified in the Oregon Natural Area Plan. These areas are evaluated by staff, boundaries are proposed, alternatives are examined, and a site and site boundaries are selected through the agency's planning process.

The U.S. Forest Service requires each RNA to be part of formal National Forest Management Plans, either through plan revisions or amendments to existing plans. In addition, Establishment Records are created for each RNA. These records include the justification for establishment, legal boundary descriptions, maps, distinguishing ecological features, environmental analyses, and management issues and guidelines. RNAs become officially established once an Establishment Record is completed and signed by the Region 6 Regional Forester with concurrence by the U.S. Forest Service Pacific Northwest Research Station Director, on behalf of the Chief of the U.S. Forest Service and Secretary of Agriculture.

In Oregon, the Bureau of Land Management (BLM) generally establishes RNAs during updates to their resource management plans (RMPs). The RNA is established when the RMP is approved by the Oregon/Washington BLM State Office. The U.S. Fish and Wildlife Service, the National Park Service, and the Army Corps of Engineers each follow similar protocols to establish RNAs on their lands.

Natural Area Protection on Private Lands in Oregon

The register is an official list of areas that contain significant natural heritage resources and/or special species. Private individuals or organizations may voluntarily designate all or part of their property as a natural area. To include a site on the register, the Parks Commission must determine that an area is predominantly natural, or has an example of an ecosystem type or species needing conservation.

For any privately owned site to be included on the register, the Parks and Recreation Commission needs the written consent of the owner and a completed summary form (Appendix 1). After staff reviews the data on the form for accuracy, they recommend the site for inclusion on the register. The Commission then acts on this recommendation.

A private site can be removed from the register if OPRD receives a letter from the property owner indicating they no longer wish it registered or if the ecosystems or species for which it was registered are no longer present at the site.

As of June 30, 2015, the Register of Natural Heritage Resources included 113 sites found on both state and private lands. State agencies may choose to register sites, if they want recognition that their management plans are conserving identified ecosystems or species. The list of all sites on the register is found in Appendix 2. More information on these sites is available from the Oregon Biodiversity Information Center.

If a private landowner of a site on the Registry wishes to pursue dedication, the process follows the same outline for state agency dedications. Until 2009, to do so, the property needed to be first included on the Oregon Register of Natural Heritage Resources. This is no longer required. If a private parcel is dedicated by the Commission or was previously dedicated by the State Land Board, an Instrument of Dedication is provided to the landowner, and is recorded in the office of the clerk of the county in which the property exists. This Instrument may be highly variable in nature.

Private landowners may terminate the dedication at any time in accordance with the procedures outlined in the dedication agreement. Since participation in Natural Areas conservation is entirely voluntary for the private landowner, incentives for the dedication of lands have been established. Landowners who dedicate their property as a Natural Area can apply for and obtain property tax exemptions. If tax exemptions are obtained, back taxes become due if a dedication is terminated. However, aside from conservation organizations which acquire natural areas as part of their mission, no private landowners have yet chosen to dedicate their private property, indicating the incentives may not be sufficient.

Natural Area Designations

Designations are how most public and some private landowners determine how their lands will be managed. This section outlines the management designations, the level of protection they provide and the consistency of their management objectives with the goals of Oregon's Natural Areas Program.

There are many agencies and organizations not included in the ecoregional lists that play a role in the identification and conservation of natural areas even though they may not manage lands. The Oregon Watershed Enhancement Board provides funding for watershed groups, as well as for easements and acquisitions, both of which can lead to important protections for species and habitats. Federal agencies such as the U.S. Natural Resources Conservation Service and local Soil and Water Conservation Districts help protect lands and water and maintain close contact with the agricultural community. Together, these agencies have a very important role to play in conserving nature in Oregon.

In evaluating the level of protection that various agency management designations provide, Oregon has adopted criteria from a national effort to develop a protected areas database, called the PAD-US. The project recognizes three main areas which describe how well sites or designations work at protecting diversity. These standard definitions and the spatial database build using them in Oregon represent the most comprehensive criteria and data developed to date.

1. **Management Intent:** What is the goal or objective of the designation as it relates to the conservation of biodiversity, and is it compatible if not identical with those for managing natural areas? Most sites are designated as 1- conservation focus, 2- conservation compatible, 3- conservation neutral and 4- unknown.
2. **Permanence:** What is the length of time the designation is in place. These include permanent, long-term, temporary and unknown.
3. **Effective Management Potential:** The ability of the land management entity to implement the intent of the designation. This has to do with agencies having the governance structure, the planning framework and the resources to manage the property as intended. This was created to address “paper parks” from Central and South America, but can be applied to some private, state and even federal natural areas. This criteria has not been applied to all natural areas in this plan, but will be completed soon.

State Agency Designations

State Natural Area (SNA)

Purpose: (1) To protect examples of terrestrial and aquatic ecosystems; (2) to serve as gene pool reserves; (3) to serve as benchmarks against which the influences of human activities may be compared; and (4) to provide outdoor laboratories for research and education.

Administering Agencies: State Parks and Recreation Department, Department of Forestry, Department of Fish and Wildlife, Oregon Military Department and Conservation Organizations.

Management Intent: Natural Area focused

Permanence: Permanent. While state natural areas can be terminated, none have been and they are not likely to be.

Comments: Ten sites have been dedicated on state lands to date and several others are currently under consideration.

National Estuarine Research Reserve (NERR)

Purpose: The NERR System is a national network of reserves established for long-term research, education and stewardship. This partnership program between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states protects more than a million acres of estuarine land and water, providing essential habitat for fish and wildlife, offers educational opportunities for students, teachers and the public and serves as living laboratories for scientists.

Administering Agency: State Land Board via Department of State Lands, supported by NOAA.

Management Intent: Natural Area focused

Permanence: Permanent

Comments: Variable, some lands are adequately protected, others are not.

Marine Garden (MG)

Purpose: To provide intertidal areas for enjoyment of or learning about intertidal resources. Marine life in these areas will be protected by prohibiting the taking of shellfish and other marine invertebrates.

Administrative Structure: Marine Gardens are a management designation for rocky shores listed in Rocky Shore Management Strategy of the Oregon Territorial Sea Plan. The Oregon Fish and Wildlife Commission designates Marine Garden sites through regulation, which includes regulations for taking marine invertebrates, shellfish and finfish pursuant to designation. The most current ODFW designations are described in the 2011 Sport Fishing Regulations document (ODFW, 2010). OPRD could adopt complementary regulations to protect marine algae for rocky intertidal areas within the Ocean Shore State Recreation Area.

Designation: Secure for seven sites: Otter Rock, Haystack Rock, Cape Perpetua, Yaquina Head, Cape Kiwanda, Yachats and Harris Beach.

Protection: Fair, not because of regulations but rather because the regulations are not well known or enforced, and because clear rules are needed to prohibit taking of intertidal marine algae.

Marine Habitat Refuge (HR)

Purpose: To ensure that various representative areas of marine life in Oregon's rocky shores will be managed to protect natural habitat values and to maintain viable populations of marine plants and animals.

Administrative Structure: Marine Habitat Refuges are a management designation for rocky shores listed in Rocky Shore Management Strategy of the Oregon Territorial Sea Plan. The Oregon Fish and Wildlife Commission designates Marine Habitat Refuge sites through regulation of collecting or harvesting marine animal life. The Department of Fish and Wildlife administers regulations pursuant to designation. Oregon Parks and Recreation Department could adopt complementary regulations to protect marine algae for rocky intertidal areas within state park boundaries.

Designation: Secure for Whale Cove.

Protection: Variable, uncertain, due to lack of access control or on-site monitoring for compliance with regulations by either ODFW or OPRD.

Marine Priority Rock and Reef (PRR)

Purpose: To designate offshore rocks, islands, or reefs determined to need study or management action.

Administrative Structure: Ocean Policy Advisory Council of the Ocean Program of the Department of Land Conservation and Development (OPAC).

Management Intent: Natural Areas focused

Permanence: Permanent

Comments: These are inherently protected, there is no management category designated for these sites. However, fishing and collection can occur in these sites under existing laws.

Marine Research Reserve (RR)

Purpose: To protect and manage areas suitable or being used for scientific study or research including baseline study, monitoring, or applied research.

Administrative Structure: Marine Research Reserves are a management designation for rocky shores listed in Rocky Shore Management Strategy of the Oregon Territorial Sea Plan. The Oregon Fish and Wildlife Commission has designated some Marine Research Reserve sites (subtidal and intertidal) through regulation of collecting or harvesting marine animal life. The Department of Fish and Wildlife administers regulations pursuant to designation. Oregon Parks and Recreation Department could adopt complementary regulations to protect intertidal algae within the Ocean Shore State Recreation Area.

Designation: Secure for Boiler Bay Research Reserve, Pirate Cove Research Reserve, Neptune State Park Research Reserve, Gregory Point Subtidal Research Reserve, Cape Arago Research Reserve and Brookings Research Reserve.

Protection: Variable, uncertain, due to lack of access control or on-site monitoring for compliance with regulations by either ODFW or OPRD.

Marine Reserve (MR)

Purpose: To protect areas of Oregon's seas or adjacent rocky intertidal areas from all extractive activities except as necessary for monitoring and research

Administrative Structure: Marine Reserve sites are recommended by the Ocean Policy Advisory Council, approved by the state legislature and designated by state agencies, including ODFW and DSL.

Management Intent: Likely Natural Area compatible; takes an ecosystem approach to conserving marine resources, but still in development.

Designation: Pilot reserves have been established for Red Fish Rocks and Otter Rock.

Permanence: Objectives are to provide lasting protection, but as this is a new designation these details are yet to be worked out

Scenic Waterway (SW)

Purpose: To provide examples of wild and scenic rivers.

Administering Agency: Parks and Recreation Department and the Department of Water Resources.

Management Intent: Natural Area compatible, but variable, depending on landowner actions, commitment and land management goals.

Permanence: Short term only on private lands; the designation is permanent, but no protection implied on state lands.

Comments: State, federal, municipal, county or private landowners may register lands upon approval of the Natural Heritage Advisory Council. A few areas have been registered to date.

Federal Agency Designations

Area of Critical Environmental Concern (ACEC)

Purpose: An area within the Bureau of Land Management (BLM) public lands where special management attention is required to protect and to prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Administering Agency: USDI Bureau of Land Management

Management Intent: Natural Area focused, in general. A few culturally focused ACECs might not be characterized as Natural Area compatible.

Permanence: Variable. Generally permanent on non-forested lands. Forested, O&C lands remain in question, due to uncertainty as to their long-term management.

Comments: Not all ecosystems and species contained within ACECs are considered adequately protected in this Plan. However, if an individual site has a management plan which protects natural area values, they can be evaluated separately under this designation. BLM RNA's represent a subcategory of an ACEC.

National Natural Landmark (NNL)

Purpose: To encourage the preservation of areas that illustrate the ecological and geological character of the United States; to enhance the educational and scientific values of the areas thus preserved; to strengthen cultural appreciation of natural history; and to foster a wider interest and concern in the conservation of the Natural Landmarks Program's natural heritage.

Administering Structure: The National Park Service is responsible for the NNL designation, although the management is dependent on the individual private or public land owner/manager.

Management Intent: Natural Area focused.

Permanence: Temporary. There is no long-term protection for any NNL, although publicly owned sites with this designation are likely to remain protected, given the recognition they receive.

Comments: Designation of a National Landmark carries with it no binding restrictions on management or use of the site. It is the equivalent of a national registry program, national recognition of the importance of the site.

National Parks (NP) and National Park Service National Monuments (NM)

Purpose: To preserve the outstanding natural, historical and recreational resources of the United States.

Administering Agency: USDI National Park Service

Management Intent: Natural Area focused.

Permanence: Permanent.

Comments: By and large, all species and ecosystem types within National Parks are considered adequately protected unless they are in an area developed for recreation.

U.S. Forest Service and Bureau of Land Management National Monuments (NM)

Purpose: To preserve the outstanding natural, historical and recreational resources of the U.S.

Administering Agency: USDI Bureau of Land Management and USDA Forest Service

Management Intent: Variable – either natural area focused or natural area compatible.

Permanence: Permanent.

Comments: Recreation, and occasionally livestock use occur in BLM or FS National Monuments. As a result, Research Natural Areas will likely be proposed to protect important plant associations present in them.

National Wildlife Refuges (NWR)

Purpose: To provide, preserve, restore, and manage a national network of lands and waters sufficient in size, diversity and location to meet society's needs for areas where the widest possible spectrum of benefits associated with wildlife and wild lands is enhanced and made available.

Administering Agency: USDI Fish and Wildlife Service

Management Intent: Variable. Some refuges, and parts of other refuges, are Natural Area focused. Others are Natural Area compatible, and still others are not compatible, with areas farmed or altered to support specific wildlife species.

Permanence: Permanent.

Comments: Establishment of Research Natural Areas with specific management plans within Refuges is considered adequate protection for species and ecosystems in this plan. There are large areas in wildlife refuges such as Hart Mountain NWR, where the management plan restricts disturbances enough to support long-term research and education, and therefore are effective natural areas.

Outstanding Natural Areas (ONA)

Purpose: An area of unusual natural characteristics where management of recreation activities is necessary to preserve those characteristics.

Administering Agency: USDI Bureau of Land Management

Management Intent: Natural Area compatible

Permanence: Long-term. These are established in local Resource Management Plans, and can be changed, but they rarely have been.

Comments: These are all designated as ACECs as well as ONAs. The designation in the list of ecosystems could read ONA/ACEC for these sites.

Research Natural Areas (RNA)

Purpose: (1) To preserve examples of all significant natural ecosystems for comparison with those influenced by man; (2) to provide educational and research areas for ecological and environmental studies; and (3) to preserve gene pools of typical and endangered plants and animals.

Administering Agencies: US Forest Service, Bureau of Land Management, Department of Defense (Navy and Army Corps of Engineers), National Park Service, and US Fish and Wildlife Service.

Management Intent: Natural Area focused

Permanence: Permanent

Comments: Federal agencies have different protocols for establishing Research Natural Areas (RNAs) on their lands. The Forest Service requires every RNA to be part of formal Forest Management Plans, either through plan revisions or amendments. In addition, an Establishment Record is created for each RNA, which include the justification for establishment, legal boundary descriptions, maps, distinguishing ecological features, environmental analyses and management issues and guidelines. RNAs become officially established once an Establishment Record is completed and signed by the Region 6 Regional Forester with concurrence by the Pacific Northwest Research Station Director, on behalf of the Chief of the Forest Service and Secretary of Agriculture.

In Oregon, the BLM generally establishes RNAs during updates to their resource management plans (RMPs). Sites are identified as containing plant associations or species identified in the Natural Areas Plan. These areas are evaluated by staff, boundaries are proposed, alternatives are examined and a recommended alternative is selected. The RNA is established when the RMP is approved by the Oregon/Washington BLM State Office. The National Park Service and the U.S. Fish and Wildlife Service follow similar protocols to establish RNAs on their lands.

Special Interest Areas (SIA)

Purpose: To protect, and where appropriate, foster public use and enjoyment of areas with scenic, historical, geological, botanical, zoological, paleontological or other special characteristics. To classify areas that possess unusual recreational and scientific values, so that these values are available for public study, use or enjoyment.

Administering Agency: USDA Forest Service.

Management Intent: Natural Area focused.

Permanence: Long-term, to potentially permanent. These are established in a Forest Plan, but can be changed in a Forest Plan update. The existing plans were to be updated each decade, but have been in place for 25 years.

Comments: These areas are managed for various uses substantially in natural condition, which varies protection of species or ecosystems. For example, salvage logging may be allowed in SIAs in certain instances. As a result, SIAs are not always considered optimal designations for a natural area.

Wild and Scenic Rivers (WSR)

Purpose: To protect the river's aesthetic, scenic, historic, archaeological and scientific features.

Administering Agencies: Several agencies, especially the U.S. Department of the Interior

Management Intent: Natural Area compatible.

Permanence: Permanent

Comments: Management plans result in varying degrees of protection of ecosystems or species based on the special attributes of the area. Salvage logging and grazing are not necessarily excluded from sites with this designation.

Wilderness Areas (WA)

Purpose: Wilderness Areas are devoted to the public purposes of recreational, scenic, scientific, educational, conservation and historical use.

Administering Agencies: USDA Forest Service, USDI Bureau of Land Management

Management Intent: Natural Area compatible or occasionally focused.

Permanence: Permanent

Comments: Certain activities not compatible with natural area uses may be permitted in Wilderness Areas, such as heavy recreation, domestic livestock grazing or mining. For this reason, the Natural Areas Program and the PNW Natural Area Committee continue to try to designate Research Natural Areas within established Wilderness Areas.

Wilderness Study Areas (WSAs) are areas under study for inclusion in the wilderness system. These are usually managed as Wilderness Areas. In Oregon, grazing or mining rarely occur in WSAs, so parts of these areas can represent an ecosystem or species, if recreation is not likely to impact the site, although these are not permanent.

Tribal Designations

Tribal Wildlife Conservation Lands

Purpose: To conserve for present and future use the diversity and integrity of biotic communities of plants and animals within natural ecosystems and to safeguard the genetic diversity of species on which their continuing evolution depends.

Administering Agency: Sovereign nations of the Burns-Piaute Tribe, Confederated Tribes of the Grand Ronde, Confederated Tribes Umatilla Indian Reservation, and the Confederated Tribes of the Warm Springs have lands identified in this plan.

Management Intent: Focused on conserving and restoring fish and wildlife habitats.

Permanence: Permanent

Comments: The sites included in this plan are properties that have been acquired by the the Tribes as part of the Bonneville Mitigation Program, to restore lost fish and wildlife habitat. The lands included have significant natural area value. The tribes have individual designations for these lands.

International Designations

Biosphere Reserves

Purpose: To conserve the diversity and integrity of biotic communities of plants and animals within natural ecosystems and to safeguard the genetic diversity of species.

Administering Agency: UNESCO, United Nations

Management Intent: Natural Area focused.

Permanence: Permanent

Local Designations

Metro Natural Areas

Purpose: To protect and enhance habitat for fish, wildlife and water quality. The natural areas emphasize protection of natural area lands now in urban areas or in areas where development is likely to occur.

Administering Agency: Metro Regional Government, City of Portland, other Metro local governments

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These are generally in urban settings, which while adequately protected are often influenced by the significant human disturbances surrounding them. As a result, these urban natural areas are rarely used to protect plant associations or species in the plan.

Private Organizations

Columbia Land Trust (CLT)

Purpose: To conserve and care for important places in the lower Columbia River region.

Administering Agency: Columbia Land Trust.

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of State Natural Areas.

Deschutes Land Trust (DLC)

Purpose: To work cooperatively with landowners to conserve land for wildlife, scenic views and local communities.

Administering Agency: Deschutes Land Trust.

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of State Natural Areas.

Greenbelt Land Trust (CLT)

Purpose: To protect in perpetuity native habitats, working lands, and lands of natural beauty, which provide a connection to the natural world for residents of the mid-Willamette Valley.

Administering Agency: Greenbelt Land Trust.

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of State Natural Areas.

McKenzie River Trust

Purpose: To protect and care for lands in western Oregon and the rivers that flow through them.

Administering Agency: McKenzie River Trust.

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of State Natural Areas.

The Nature Conservancy (TNC)

Purpose: To conserve the lands and waters on which all life depends.

Administering Agency: The Nature Conservancy

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of Natural Areas.

North Coast Land Conservancy (NCLC)

Purpose: To conserve and connect the landscape of Oregon's coastal lands.

Administering Agency: North Coast Land Conservancy.

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of Natural Areas

The Wetlands Conservancy (TWC)

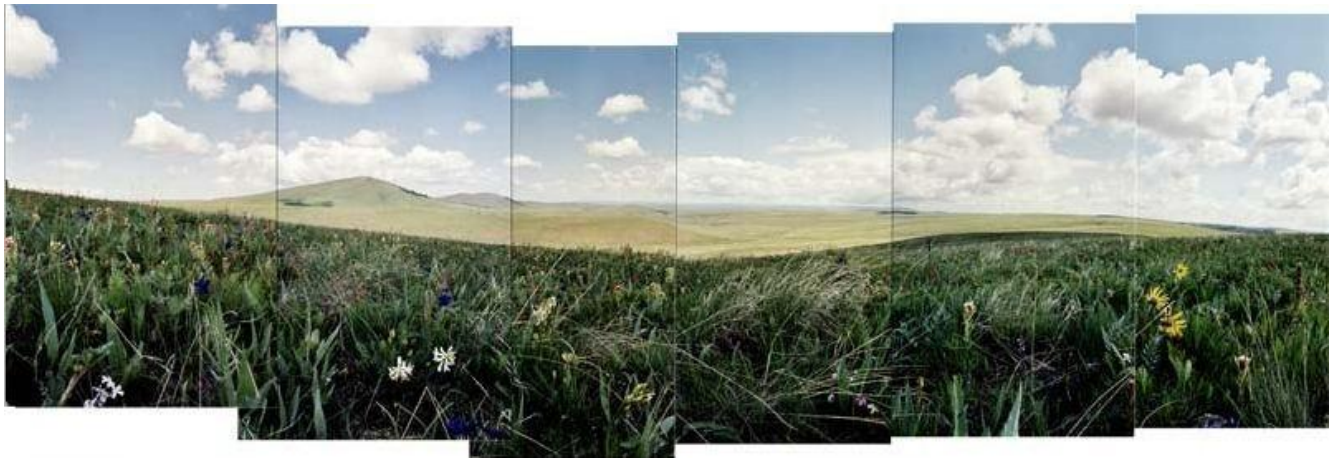
Purpose: To protect examples of high priority wetlands and aquatic ecosystems.

Administering Agency: The Wetlands Conservancy

Management Intent: Natural Area focused.

Permanence: Permanent

Comments: These areas are privately owned equivalents of Natural Areas



Zumwalt Priarie Preserve © Christopher Rauschenberg

CHAPTER 4. MANAGEMENT AND STEWARDSHIP

Vision

An adaptive, intentional, and science-based approach to management results in a natural areas network that is resilient to threats and environmental changes that will take place over time.

Management Goals and Objectives

The ecosystems represented in the natural areas network today are the result of cumulative effects of both natural and anthropogenic influences over millennia. They are not "pristine" in the sense that they have never been influenced by humans, yet they do represent some of the best examples of ecosystems whose present conditions have been primarily formed by non-human ("natural") processes. They are also not static, in that these sites will continue to change over time due to both natural and human influences. Scientific knowledge and perceptions of the natural world will also continue to evolve, as will social trends, public needs and legislative and regulatory direction.

Thus, long-term management strategies will need to be both adaptable and intentional in responding to these ecological and social changes (Carey 2007). This includes forethought as to how these ecosystems should look and function over the long term (e.g., centuries), as well as consideration for the long-term consequences of management actions taken or not taken today. For some sites, this may mean leaving them to develop with little or no human intervention (e.g., old-growth rainforest). For other sites, there is growing recognition that "hands-off" management can have unintended negative consequences (e.g., long-term fire suppression of dry, interior forest) and restoration activities like prescribed fire or thinning may be needed to shift these sites back onto more natural ecological trajectories.

These restoration efforts might best focus on restoring ecological processes, rather than a desired end-state or ecological stage. This is especially important given little precedent for understanding or managing for rapid environmental change (Callicott 2002, Millar 2008).

At times, management will need to react to immediate threats like catastrophic human-induced fire or invasive species. Intentional, proactive planning for how best to respond for each site could help reduce some of the negative consequences and costs associated with making decisions on the spot, or case by case. For example, lack of a well-communicated fire response plan may lead to suppression activities that result in unnecessary damage to soils, vegetation and aquatic systems. Likewise, lack of an early-detection plan for invasive species may lead to expensive control options that could have otherwise been avoided had the species been detected early.

Management will also need to address a growing number of environmental threats in the region (Gamon 2007). Of these, climate change may be the most pervasive management challenge. Even small changes in climate patterns could affect a wide range of ecological interactions and ecosystem processes and result in local extirpations of rare organisms (Joyce et al. 2008, Kappelle et al. 1999, Millar et al. 2007, Noss 2001). There is currently little scientific basis for how best to manage for climate change and it will be important to understand and ultimately manage for climate change at a hierarchy of spatial and temporal scales, from individual organisms to global ecosystems (Mustin et al. 2007). A number of different strategies may also be required (Millar 2008). Given its ecological depth and distribution, the natural areas network could serve as an important foundation for studying and developing regional or even global approaches to managing for climate change.

Future management strategies will also need to address appropriate uses of natural areas as human populations continue to increase in the region. This includes better understanding of the impacts of human activities on natural areas. A number of concerns have already arisen over off-road vehicle use, horseback riding, livestock grazing, harvesting wildland products like mushrooms and floral greens, hunting, fishing and camping. Use is especially of

concern for sites that have infrastructures such as trailheads, parking lots or established camp sites that encourage human use. Misuse of sites may, in part, be the result of lack of knowledge or appreciation for the importance of natural areas. Thus, there is potential to reduce human-use impacts through public outreach, education, and greater on-the-ground presence.

Saddle Mountain State Natural Area

CHAPTER 5. MONITORING AND DATA MANAGEMENT

Vision

Monitoring data are ecologically driven, consistently collected to acceptable scientific standards across the network, stored and maintained properly and form an integral part of a feedback loop for making and evaluating management decisions.

Monitoring Goals and Objectives

Collecting baseline and monitoring data provides a number of useful benefits for the long-term management of natural areas, including: (1) site-specific data for making management decisions; (2) feedback on the effectiveness of mitigation, restoration, and offsite management activities; (3) inventory of the ecological characteristics of a site; (4) quantified assessment of natural and anthropogenic influences over time; (5) data for refining monitoring and management protocols; and (6) information for long-term scientific study of ecosystems and ecological processes.

A number of monitoring and data management issues will need to be resolved to strengthen the current monitoring program. First, ecological monitoring programs have been inconsistently established across the network (e.g., about 20% of federal sites, 50% of state sites, 75% of private conservation organization's sites). For those sites that are not monitored, information about the site is often limited to lists of plant and wildlife species expected to occur on these sites based on the initial designation information, rather than actual current inventories.

Second, where monitoring data have been collected, problems can range from different protocols used across sites, divergence of protocols over time, lack of connection between data collected and site management objectives, and irregular monitoring schedules once initial data has been collected. A long-term monitoring program with shared monitoring goals, diverse but consistent protocols to meet both site-specific and cross-site objectives, and regular monitoring schedules can increase sampling power, strengthen statistical inferences within and across sites, and ultimately provide empirical support for management actions both within and around natural areas.

Third, current monitoring data are primarily focused on vegetation and related composition. Opportunities exist for expanding monitoring programs to (1) capture a fuller gradient of multi-dimensional structural measures that evaluate broader ecological processes and (2) include a wider range of indicators that can measure ecological health and function over time due to environmental change, including microclimate assessments of key wildlife and invertebrate communities, nutrient cycling, soils and carbon flux.

This might include measures that can evaluate changes in ecological processes rather than simply changes in the spatial distribution or abundance of select species or taxonomic groups (e.g., McIntire and Fajardo 2009). It could also include measuring changes to trophic hierarchies over time, as we have little knowledge about where environmental change will have the greatest effects or where it will have the first effects (e.g., at the top or bottom of a food chain; Wagner and Adrian 2009).

Fourth, many of the strategies outlined here will result in increased use of natural areas. The risk in promoting use is that it could affect the environmental integrity of some sites, especially those that are sensitive to foot traffic or sites that have established infrastructures that might already promote heavy use (e.g., parking areas, trails). Therefore, some form of monitoring focused on human-use effects may be needed to help preempt any long-term negative consequences that promoting additional use may have for some sites.

Finally, a cursory inquiry into data management strategies across agencies suggest that data for natural areas are not always handled in ways that ensure their long-term protection and use. Many datasets reside in unsecured boxes, have never been entered into an electronic database or have no associated metadata to provide the necessary context

for the data. Long-term data management requires a program that extends beyond the employment of individual administrators. Having a long-term data management capacity allows for reconstruction of historic data, provides access to data to the broader community, reduces time and effort spent searching for data and allows for data to be used to address broad scale questions (Michener and Brunt 2000).

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Oak savanna sampling in the Willamette Valley (ORBIC staff)

CHAPTER 6. RESEARCH

Vision

The depth of research conducted throughout the natural areas network contributes to the understanding and resolution of important scientific, social and economic issues across a range of spatial and temporal scales.

Research Goals and Objectives

A primary purpose for natural areas is to allow study of ecological processes that can improve our understanding of the natural world. Many of the issues facing conservation, such as climate change and invasive species, will require refinement of ecological theory and better understanding of ecological processes. Research on natural areas may be one of the best ways to gain this knowledge, especially given that they represent some of the most intact ecosystems left on the landscape.

A number of important research findings have been based on data collected from natural areas in the past, including studies of old-growth forest that helped lead to the Northwest Forest Plan, the set of documents that has guided management activities on federal lands in the range of the northern spotted owl since 1994 (USDA and USDI 1994). However, many natural areas have received little research attention (Greene et al. 1986). Reasons are varied, including relative remoteness of sites from other research sites or centers of research, lack of site replication, some sites representing ecosystems not under current scientific scrutiny and recent establishment for a number of sites. The lack of use has also been the result of unfamiliarity of researchers with the benefits of using natural areas and misconceptions over the types of research allowed on natural areas.

Agencies have also differed in the degree to which they have actively encouraged or promoted research on natural areas. These reasons suggest there is opportunity to better promote natural areas for research, both internally (within the home agency or organization) and externally to research clients.

There are a number of characteristics unique to the natural areas that make them attractive as study sites, especially for understanding ecological processes and effects of climate change:

1. They are geographically well-distributed throughout the region, representing almost the entire gradient of natural biophysical environments found in the Pacific Northwest. This includes gradients in soils, moisture, temperature, elevations, latitudes and other biotic and abiotic conditions;
2. They contain sites representing environmental extremes, including rare ecosystems that might be the most sensitive to change over time;
3. The biological diversity contained within natural areas allows for study at all hierarchical levels, from genes to individual organisms to complete communities and systems;
4. As relatively pristine sites, natural areas can be used as controls for nearby field experiments as well as benchmarks for measuring the efficacy of management activities (Julius and West 2008, Joyce et al. 2008); and
5. Most natural areas are permanently protected, allowing for long-term study. A network strategy for climate change research could include everything from collecting climatological data at remote sensing stations to periodic field surveys of climate-sensitive organisms at permanent sampling plots using standardized protocols.

Natural areas can also be promoted as satellite study sites in association with other major ecological networks and programs, including: Wilderness Areas, National Wild and Scenic Rivers, National Parks, National Monuments, U.S. Forest Service Experimental Forests and Ranges, National Estuarine Research Reserves, the US Geological Survey Hydrologic Benchmark Network program, United Nations Biosphere Reserves, National Science Foundation reserves including the Long-Term Ecological Research (LTER) Network and the National Ecological Observatory Network (NEON),

Long-Term Ecosystem Productivity forestry research network, and the National Atmospheric Deposition and National Acid Precipitation Assessment Programs.

As with management and monitoring, research use of natural areas can be enhanced through dedicated funding, either as a regular component of annual agency budgets, or through funding of special projects. For example, seed grants to graduate students could help promote collaborative research with academic institutions.

Increased support for research can also be generated by better communication of research studies and their results. This includes better documentation for past and ongoing research projects, encouraging cradle-to-grave research projects to ensure that results are published, and communicating results in different ways to meet the needs of diverse audiences that have an interest in resource management.

Finally, using natural areas to build stronger ties between research and management can help strengthen the importance and relevance of research on natural areas. For example, a number of restoration projects, including woody fuels reduction, prescribed fire, and invasive species control are being proposed for natural areas. However, there is little information available on the site-specific efficacy of these tools, including how they might affect future ecological processes. Close coordination between research and management in designing studies that evaluate these restoration efforts could provide important feedback that results in better management in and around natural areas, and greater appreciation for the importance of research on these sites.

Research burn at the Metolius RNA

CHAPTER 7. EDUCATION AND COMMUNICATION

Vision

Education and communication activities connect people with nature, promote understanding of ecology and conservation, increase volunteerism, and strengthen agency and public support for the natural areas network.

Education and Communication Goals and Objectives

Part of a strong interagency network includes effective education, communication and outreach programs. Regional natural areas have been available as outdoor educational laboratories since their inception. Overall use of natural areas as sites for educational activities, however, has been relatively low.

Most natural area educational programs to date have focused on educating college-level and higher students, professional societies and special-interest groups. There is opportunity to expand the scope of educational activities to include a focus on younger (e.g. K-12) students. Recent social trends in the United States suggest that youth may no longer be getting sufficient exposure to the outdoors and that encounters with nature can help reduce aggression, calm anxiety and develop a healthy sense of self and place (Pilz et al. 2006). A number of agencies have recently added youth education as a top emphasis area (e.g. Kimbell 2009). Engaging youth can also help promote a future adult population that is environmentally literate and appreciates the importance of natural areas and wildlands (FS 2009b).

Opportunities also exist for expanding the scope of disciplines associated with the use of natural areas beyond traditional science-based fields. For example, individuals from the arts and humanities are increasingly using wildlands as settings for their nature writing, painting or other forms of artistic expression (Sitka Center for Art and Ecology 2009).

Fostering such use on natural areas can help build a constituency that appreciates and supports natural areas. Support can also be fostered within local communities near natural areas by developing volunteer and citizen science programs to assist with research, monitoring, site surveillance, restoration projects and community outreach (Lowman et al. 2009, Yung 2007). Many of the strategic actions presented here can be supported, in part, through the use of volunteers. Volunteers are not free in terms of the amount of staff time needed for recruitment, training and oversight. However, the benefits of incorporating their efforts can often outweigh these costs and offers an alternative to accomplishing tasks, especially when budgets are limited. A number of partners, supporters, and target groups could be considered.

There is also need for increasing the understanding and appreciation of natural areas within the agencies that manage them. There are still a number of misconceptions about natural areas—for example, that natural areas are small, unique pieces of land set aside solely to protect an unusual ecosystem. In part, these misconceptions have arisen because information about natural areas is often site-specific (establishment of a single site, result from a single study). These misperceptions also result when the importance of natural areas is not being effectively translated from the field (where most natural area information is generated) in ways that resonate with upper-level management. Therefore, strategic actions include those that can frame information in ways that show network-level strength and that can be directly tied to the support of agency missions. These could include:

1. Cost-savings associated with managing natural areas as a network across sites and agencies;
2. Important findings from natural areas that increased knowledge for making sound management decisions;
3. The strength of connections with other agencies, partners and organizations that resulted from participating in the natural areas network;
4. Increased public support of management activities as a result of natural areas management or research;

5. The importance of natural areas for providing high-quality sites for research; and
6. The broad biodiversity and conservation goals met by the natural area network

Weekly summer lunch program (above) and high school students sampling vegetation (below) at the Alder Creek Children's Forest in Douglas County

CHAPTER 8. ECOREGIONAL LISTS AND DEFINITIONS

Introduction

The lists of ecosystem and geology types, and the special species found in the nine Oregon ecoregions describe the diversity of the each ecoregions, and how well these types are represented in natural areas. Figure 1 identifies the nine Ecoregions used in this plan, each of which corresponds to the nine ecoregional chapters that follow. More information on the ecology or geology of these regions and more detailed maps are available in the Oregon Ecoregions EPA poster (Thorson et al. 2003). The Marine – Estuarine Ecoregion is new, and represents the only one for which the state developed the boundary, which roughly follows the continental shelf.

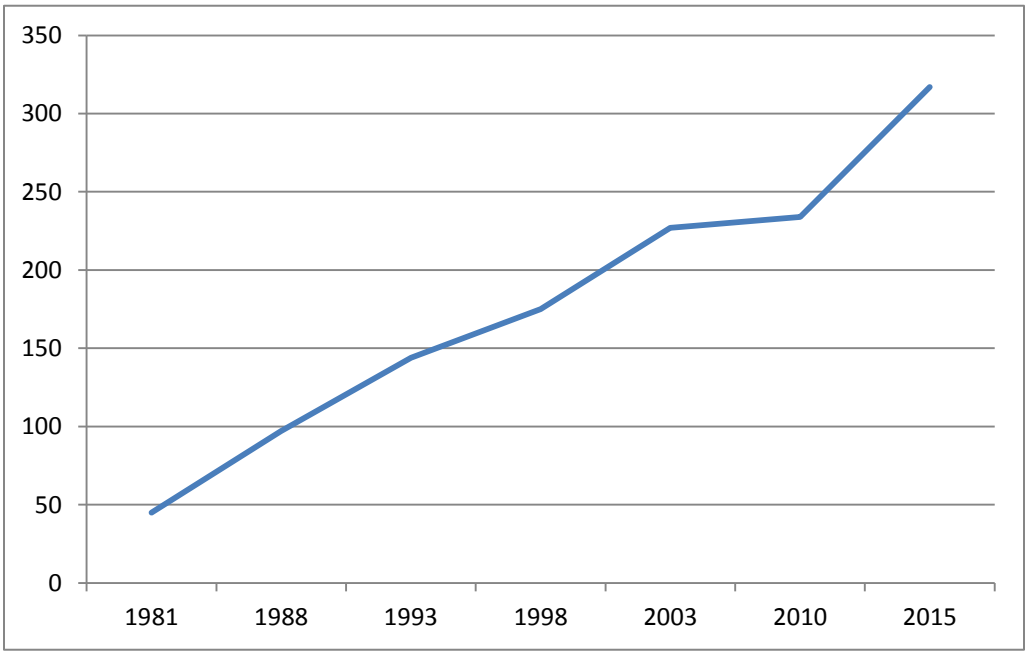
Status Summary

For each update of the Plan, the program develops a report outlining changes in the plan, and comparing the number of ecosystem types listed. The differences in protection for ecosystem types between the 1998, 2003, 2010, and the 2015 plans are illustrated in Table 1. The differences in the new plan are a small reduction in types that were poorly classified, and a significant increase in protected sites with new BLM resource management plans and USFS plans in the Blue Mountains. The reduction of protected ecosystem elements from 2003 to 2010 all occur due to the former Coast Range, Marine and Estuarine types being moved and reclassified into two separate ecoregions. Increases were the result of new natural areas designations. Stream and river ecosystem types will be added back when a system to classify them is developed and implemented.

Plan	Types	Protected	Unfilled
1998	804	252	617
2003	750	416	334
Change 98-03	-54	+164	-283
2010	722	400	322
Change 03-10	-28	-16	-12
2015	701	462	239
Change 10-15	-21	+62	-83

Table 1. Ecosystem types 1998-2015.

Figure 3 shows the number of established natural areas included in each of the Natural Heritage Plans and the current Natural Areas Plan. The number of established areas increased rapidly in the 1980s and early 1990s when initial efforts to identify and dedicate sites in the National Forest Plans and BLM Resource Management Plans took effect.



The rate of new natural area designations declined since 2003, but as described above, is currently increasing with updated federal land management plans, and increasing designations by non-governmental groups.

Figure 2. Numbers of Established Natural Areas in Oregon over time.

Overall, the percentage of unrepresented (or unfilled) types has remained the same at 44.5%, with the declines due to the loss of some western Oregon Areas of Environmental Concern counteracting some of the newly designated natural areas. Significant work remains to designate natural areas to represent many of these types. The majority of unrepresented ecosystems are the riparian forests, woodlands and wetlands from eastern Oregon and low elevation conifer forests in western Oregon. These types are the most difficult to find suitable examples for natural area designation because they have become fairly rare, or occur largely on private lands. Figure 4 shows how well ecosystems, geologic types and species are protected within each of the ecoregions in 2015.

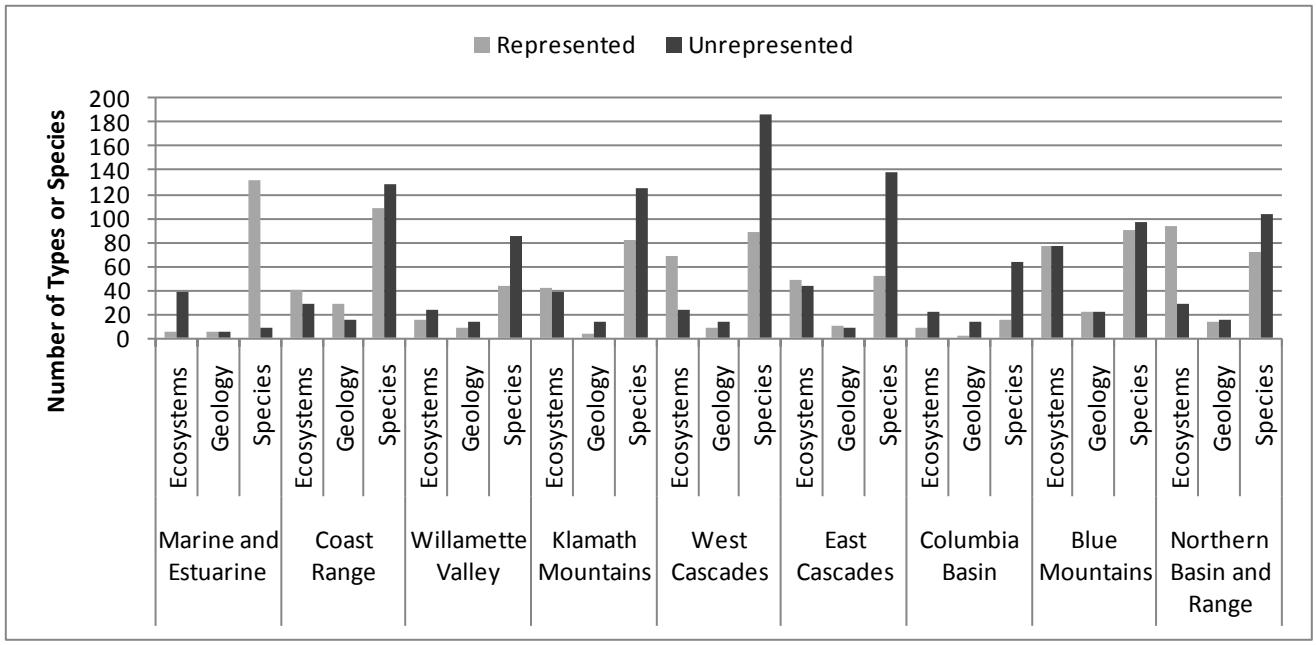


Figure 3. Numbers of Protected and Unprotected Types by Ecoregion.

As always, these lists have been significantly updated for this edition of the plan. It is hoped that agencies and the public will continue to use these lists in making decisions related to conservation. Staff from both ORBIC and OPRD and the Pacific Northwest Research Natural Area Committee also hope to continue getting feedback to improve the accuracy of the information included in these lists.

Forest Analysis

In 2015, the Institute for Natural Resources (INR) and ORBIC analyzed the 5 primarily forested ecoregions (Coast Range, Blue Mountains, Klamath Mountains, West Cascades, and East Cascades), using a new set of maps the program developed for the 2015 update of ODFW's Conservation Strategy. These maps were an integration of the 2014 forest structure models created through imputation by the Landscape Ecology, Modeling, Mapping & Analysis (LEMMA) collaborative research group at Oregon State University and the Pacific Northwest Resarch Station, with updated existing vegetation maps developed by INR, and the updated PAD-US geospatial database for Oregon maintained at ORBIC. The analysis compares the area of different major forest types that occur on and off of protected areas and also evaluates the amount of mature forests, using the LEMMA definitions, that occur in protected areas. This allows for an evaluation of which forest types may be under-represented in the ecoregional lists, based on their abundance, and which types may be over-represented. Unfortunately, there is no data available to allow for a similar analysis of the non-forested ecoregions.

Using the Lists of Ecosystems, Geologic Features and Formations, and Species.

The next nine chapters in the plan include brief ecoregional descriptions followed by the lists of ecosystem types and species. The descriptions are only included to provide the general ecological and social context of each ecoregion. Chapters include the ecosystem types first, with the terrestrial types organized by vegetation zone, followed by the wetland types. The Oregon Biodiversity Information Center and NatureServe are continuing to

work on updating the aquatic and marine classifications and these are likely to continue to be modified in future editions of the plan.

The list of ecosystem types was intitally developed in a series of workshops in 1979-1980, which modified the initial list in the "Yellow Book" (Dyrness et al. 1975). These included groups of plant assocations which generally or occasionally occur together, so as to limit the number of natural areas needed to represent the diversity of Oregon. The current list represents a slow but steady transformation of the intial ecosystem types to represent the full range of ecosystem diversity in Oregon, as contained in the International Vegetation Classification System, as described on page 5, in Chapter 2.

Ecosystem types are then followed by the list of geology formations and features, which were revised in 2003, and are little changed since then. Within each ecoregion, the geology elements are organized by the standard intervals of geological time, from the oldest (Devonian, about 320 million years ago) to the newest (the Quaternary, including the present).

Finally, the ecoregional chapters contain the list of special species elements. The special species are organized by major taxonomic group, with the invertebrates listed first, followed by the vertebrates broken up by class, then the vascular plants, the nonvascular plants, and lastly the lichens and fungi. Species are listed alphabetically by scientific name within each group.

The complete list of established natural areas in Oregon is included with a map in Chapter 11, as are the total list of sites names included in the plan. The Oregon Biodiversity Information Center also maintains a GIS cover showing all the conservation lands in Oregon. This Land Management and Stewardship coverage is available at the Oregon Geospatial Data Clearinghouse, and is also included in the Protected Areas Database of the United States (PAD-US), available from the USGS on the National Map.

How the Lists are Organized

Different TEXT COLOR IN GRAY and BLACK are used in all of the lists of ecological, geological and species elements to distinguish elements that are already protected from those needing designations. Those that are unrepresented are highlighted in BLACK. Ecosystem elements in GRAY are those with designations and management that adequately protect them in the ecoregion. This is not necessarily the case for species elements. Determining if a species is viable at these sites is more difficult. As a result, listing in the plan in black only means the species is currently known to be represented at the natural area(s) listed.

The lists for each of the ecoregions are organized as a series of tables for the different element types (ecological, geological and species). Each table has four columns. The column headings and definitions are listed below.

Agency – The agency or agencies managing lands most likely to contain examples of this type. These agencies should be working to find and designate an example of this ecosystem, geologic type or species in this ecoregion. Current agency lists are maintained on file at ORBIC.

Priority – Priorities for elements listed were determined using principles detailed in Part 1 of the plan. These priorities are subject to continual update as elements become rarer, more threatened or more secure. Current priorities, determined by the Natural Heritage Advisory Council, are maintained at the Oregon Biodiversity Information Center. Determination of adequacy of representation within a proposed area is made by the Natural Heritage Advisory Council, in cooperation with the Federal Research Natural Area Committee. Due to continual status updates, elements added to the "adequately represented" category will be maintained at the Oregon Biodiversity Information Center.

Ecosystem Type – These are intended to be succinct names for discrete, but often difficult-to-describe, ecosystems. As such, the name should be considered only a flag. Most terrestrial and wetland ecosystems are plant associations. Detailed descriptions of the terrestrial and wetland plant associations are available from Oregon Biodiversity Information Center or at the NatureServe explorer website (http://explorer.natureserve.org/servlet/NatureServe?init=Ecol

Present Representation – This column contains names of established, proposed and recommended natural areas that contain examples of the ecosystem type. Specific formatting and codes are used in this column. These include:

< = Present at this protected site, but only in small patches which provide only partial representation of the ecosystem type. If < is not present, the area is assumed to adequately represent the element. In this plan, these have only been used for ecosystems, not for geologic formations and features or for species.

ITALICS = Areas listed in italics have been recommended by agency ecologists or ORBIC staff as having excellent examples of the type, but have no formal designations.

Species that have been lost or extirpated in the ecoregions are labeled as such. Those known or suspected to be gone are differentiated as "Probably extirpated", "Extirpated" or "Extinct". For those elements considered extirpated or extinct, no agency is designated to seek representation. However, if an example of any of these extirpated types were to be located, it would immediately become a high priority for protection. Sites recommended are those high quality sites currently known. Any site meeting the quality and size criteria for the element would be suitable for designation.

The lists will be updated with each revision of the Oregon Natural Areas Plan, if possible at five-year intervals. The list of all established natural areas, registered areas, and protected areas are included as Appendix 2.

Table 2. Codes and abbreviations used in the Natural Heritage Resource lists

Priority for Ecological and Geologic Elements	**Code**
High	H
Moderate	M
Low	L
Unknown	U
Protected adequately at the listed site or sites	*
Adequately protected at the listed site or sites once final designation is completed	+
Only partially protected due to designation, size, or quality at this site	<
Priority for Species	
Species threatened or endangered throughout their range (ORBIC List 1)	1
Species threatened or endangered in Oregon, but more common elsewhere (List 2)	2
Species presumed extirpated throughout its range	1-X
Species presumed extirpated in Oregon, but persists elsewhere	2-x
Marine special species selected by the Natural Heritage Advisory Council	S
Species included because of their federal or state Endangered Species Act status	ESA
Species protected under the Marine Mammals Protection Act	MMPA
Potential Acting Agency	
Private Lands	PVT
Oregon Department of Fish and Wildlife	OFW
Oregon Department of Forestry	ODF
Oregon Department of State Lands	DSL
Oregon Department of Transportation	DOT
Oregon Ocean Policy Advisory Council	OPAC
Oregon Parks and Recreation Department	PRD
Army Corps of Engineers	ACE
Bureau of Land Management	BLM
Department of Defense	DOD
National Park Service	NPS
U.S. Fish & Wildlife Service	FWS
U.S. Forest Service	FS

Present Representation (Terrestrial)

Area of Critical Environmental Concern (BLM designation only)	ACEC
Federal Research Natural Area (Federal Agencies)	RNA
State Natural Area (formerly Natural Heritage Conservation Area)	SNA
Proposed designation (for the three designations above)	p....
National Monument (Federal Agencies)	NM
National Recreation Area	NRA
National Wildlife Refuge (U.S. Fish and Wildlife Service)	NWR
Columbia Land Trust	CLT
Confederated Tribes of the Grand Ronde	CTGR
The Nature Conservancy Preserve	TNC
North Coast Land Conservancy	NCLC
The Wetlands Conservancy	TWC
Wilderness Area (Federal Agencies)	WA
Wilderness Study Area (Federal Agencies, primarily BLM)	WSA
Wild and Scenic River (Federal Agencies)	WSR
Wildlife Management Area (Oregon Deptment of Fish and Wildlife)	WMA
Special Interest Area (U.S. Forest Service)	SIA

Present Representation (Marine and Estuarine)

Marine Garden	MG
Priority Rock and Reef	PRR
Research Reserve	RR
Marine Reserve	MR
Marine Habitat Refuge	HR
National Estuarine Research Reserve	NERR

South Slough National Estuarine Research Reserve

CHAPTER 9. MARINE AND ESTUARINE ECOREGION

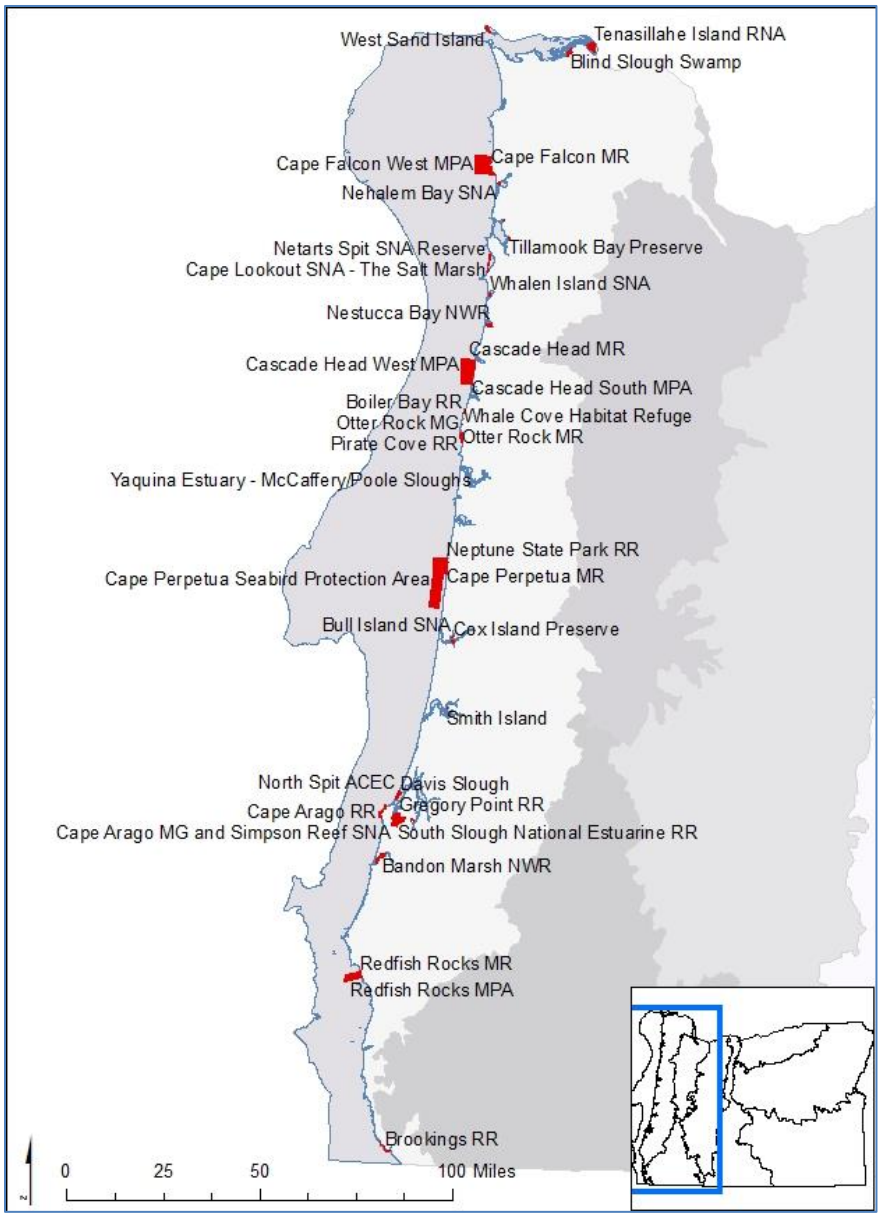


Figure 4. Map of the Oregon Marine and Estuarine Ecoregion.

The Marine and Estuarine Ecoregion includes all of Oregon's intertidal, marine and estuarine ecosystem and geologic resources, as well as all the marine and estuarine species. The classification of marine and estuarine types is a first approximation to implement a new national ecological classification created by the National Oceanic and Atmospheric Administration (NOAA) and NatureServe, based on the online Version III draft (FGDC 2010).

Protected examples of these resources are currently not well represented in Oregon's system of natural areas, and this is the first plan in which this Ecoregion is separated from the Coast Range. The publication of the *Territorial Sea Plan* (Oregon Ocean Policy Advisory Council, 1994) and current work to establish marine reserves in Oregon has created an excellent opportunity to better protect Oregon's marine and intertidal resources. Designations such as Marine Reserves, Marine Protected Areas, Marine Gardens, Habitat Refuge, Research Reserve, Seabird Protection Areas, Marine Shore and Priority Rock and Reef have been applied to many of Oregon's most significant biological and ecological marine resources.

In this plan, we have made an effort to match existing natural area needs to these designations. However, more inventories are needed to define the ecological resources of the Oregon Estuarine and Marine Ecoregion and to establish the designations necessary to ensure that they will be available for research and education. Because this is the first attempt to define natural area needs for the marine and estuarine areas in Oregon, and because the state is working hard to establish a set of marine reserves, this chapter can only represent a first iteration, which we anticipate changing significantly in the future. The council and the Oregon Biodiversity Information Center would appreciate comments, ideas for updates and any information that might help improve the lists that follow.

In establishing our Geologic types, we also worked to match existing geologic maps to newly defined geological natural area needs. However, more detailed mapping is needed to comprehensively define the geologic resources

of the Marine and Estuarine Ecoregion, particularly the subtidal/offshore area where only the broadest types have been mapped. Progress is being made in this area, and once this is done, there will be a solid basis for identifying and protecting the resources.

Figure 6 shows the numbers of ecosystem and geologic types represented and not represented in the network of established natural areas in this ecoregion. It also shows the special species representation. The selection of special species also represented a challenge in this ecoregion, since these species are not tracked or monitored in the same way the terrestrial species are in the other ecoregions.

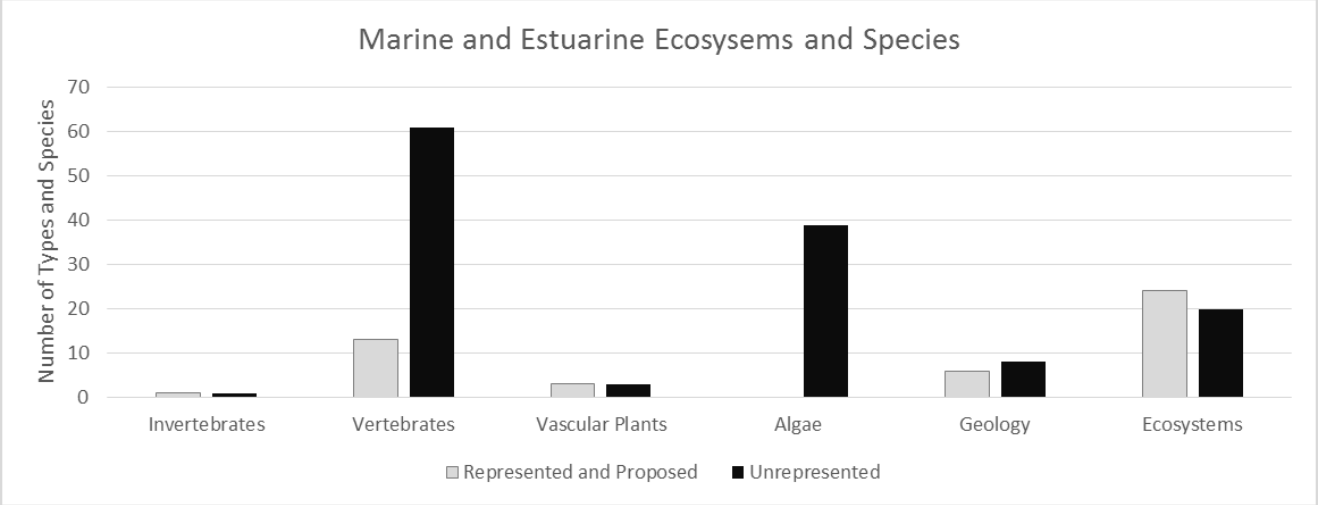


Figure 5. Represented and Unrepresented Ecosystems, Geologic Features and Formations, and Species of the Marine and Estuarine Ecoregion.

Otter Rock Marine Reserve, photograph from OPRD

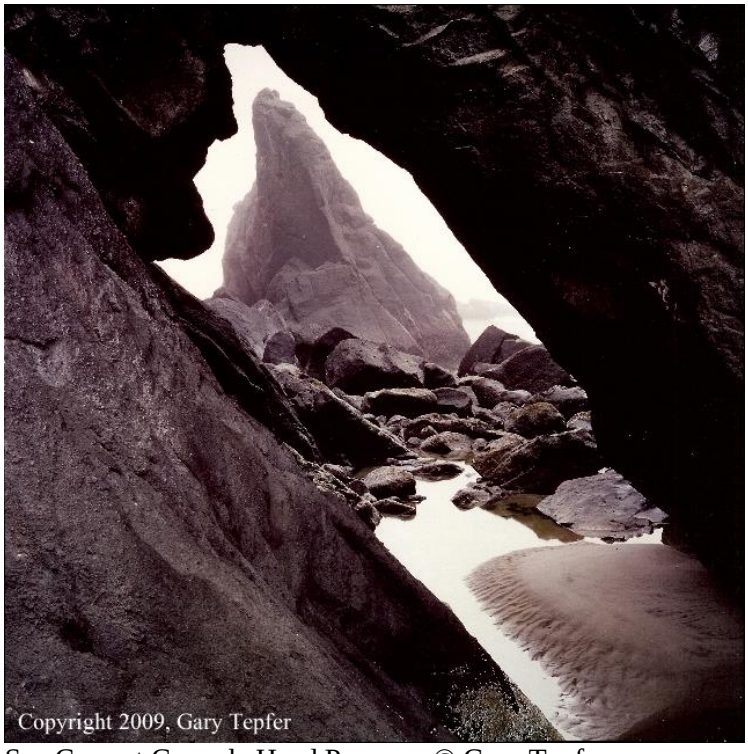
MARINE AND ESTUARINE ECOSYSTEMS

Agency	Priority		Ecosystem Name	Present Representation
			Marine	
		1.	Subtidal, high-relief rock bottom with Nereocystis kelp bed with little or no algal sub-canopy.	Orford Reef PRR
	+	2.	Subtidal, high-relief rock bottom with Macrocystis kelp bed with little or no algal sub-canopy.	Cape Arago PMR Simpson Reef PRR/HR
	*	3.	Subtidal, high-relief rock bottom with dense algal sub-canopy under kelp bed.	Redfish Rocks MR
DSL, PRD	U	4.	Subtidal, high-relief, unvegetated rock bottom.	
	*	5.	Subtidal, low-relief rock bottom with Nereocystis kelp bed and possibly Macrocystis kelp bed.	Pirate Cove RR
	*	6.	Subtidal, low-relief rock bottom with dense algal sub-canopy under kelp.	Nellies Cove HR
	*	7.	Subtidal, low-relief, unvegetated rock bottom.	Pirate Cove RR
	*	8.	Subtidal, high-energy sandy bottom.	Netarts Sand Spit SNA
DSL, PRD	U	9.	Subtidal low-energy sandy bottom.	
DSL	U	10.	Subtidal mud bottom.	
	*	11.	Subtidal gravel bottom.	Orford Reef PRR
	*	12.	Subtidal hard bottoms with reef building animals.	Norton Gulch (Gregory Point RR)
DSL	U	13.	Subtidal, aphotic zone with boulder or bedrock.	
DSL	U	14.	Subtidal, aphotic zone with shale or shingle.	
DSL	U	15.	Subtidal, aphotic zone sandy bottom.	
	*	16.	Intertidal, exposed bedrock, mussel beds.	Yachats MG Boiler Bay RR
	+	17.	Intertidal, exposed bedrock, algal dominated.	North Cove - Cape Arago RR Cape Arago PMR
	*	18.	Intertidal, exposed bedrock, mussel beds.	Yachats MG Boiler Bay RR
	*	19.	Intertidal, exposed bedrock, surfgrass beds.	Otter Rock MG Boiler Bay RR
DSL, PRD	U	20.	Intertidal, exposed bedrock, surge channels.	
DSL, PRD	U	21.	Intertidal, exposed bedrock/boulders subject to sand scour and periodic sand inundation.	*Ecola Point* *Seal Rock*
DSL, PRD	U	22.	Intertidal, exposed boulder field, algal dominated.	*Cape Lookout*
	*	23.	Intertidal, exposed boulder field, not algal dominated.	Redfish Rocks MR
DSL, PRD	U	24.	Intertidal, semi-protected, bedrock, surfgrass beds.	
DSL, PRD	U	25.	Intertidal, semi-protected, bedrock, bedrock shelf.	*Chetco Cove*
	+	26.	Intertidal, semi-protected, boulder field.	Cape Arago PMR

Agency	Priority		Ecosystem Name	Present Representation
DSL, PRD	U	27.	Intertidal sandy/gravelly beach.	
	*	28.	Intertidal, low exposure sandy beach.	Netarts Sand Spit SNA
DSL, PRD	U	29.	Intertidal, high exposure sandy beach.	
DSL, PRD	U	30.	Highly erosive seacliffs.	Cape Kiwanda MG *Seal Rock*
	*	31.	Erosion resistant seacliffs, with caves if possible.	Cascade Head MR Cape Lookout SNA
	U	32.	Offshore rocks, awash at high tide.	*Rogue Reef* Simpson Reef SNA
DSL, FWS	U	33.	Offshore rocks, not awash at high tide, with soil and vegetation.	*Goat Island* Three Arch Rocks NWR
DSL, FWS	U	34.	Offshore rocks, not awash, unvegetated.	*Pillar Rock (Cape Meares)*
			Estuarine	
DSL	U	35.	Unvegetated, fine sediment (mud to sand) in subtidal zone.	
DSL	U	36.	Eelgrass beds, on fine (mud to sand) unconsolidated substrata in subtidal zone.	
	+	37.	Unvegetated muds in intertidal zone, including *Abarenicola* in lower or middle estuary.	South Slough pSNA
	+	38.	Unvegetated muddy sands in intertidal zone, including *Mya arenia* in upper estuary.	South Slough pSNA
DSL	U	39.	Unvegetated sands in intertidal zone, including *Callinassa californionis* in lower or middle estuary.	
DSL	U	40.	Intertidal, lower estuary, vegetated and unvegetated rocky surfaces, including macroalgal beds (*Enteromorpha, Ulva, Fucus, Polysiphonia,* and *Sargassum*).	
	+	41.	Intertidal, lower estuary, vegetated fine, unconsolidated substrata, including eelgrass beds and macroalgal mats (*Enteromorpha, Ulva, Vaucheria*, and *Gracilaria*).	South Slough pSNA
	*	42.	Low elevation/high salinity intertidal marsh on sand (dominants including Lyngby sedge, saltgrass, glasswort, three-square bulrush, seacoast bulrush and arrow grass).	Netarts Sand Spit SNA
	*	43.	Low elevation/high salinity intertidal marsh on silt (dominants including Lyngby sedge, saltgrass, glasswort, three-square bulrush, seacoast bulrush and arrow grass).	Cox Island Preserve TNC Bull Island SNA Smith Island SNA
	*	44.	High elevation/low salinity intertidal salt marsh (dominants including Douglas aster, Lyngby sedge, tufted hairgrass and silverweed).	South Slough pSNA Davis Slough SNA Smith Island SNA

MARINE AND ESTUARINE GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority	Formation or Feature Name	Present Representation
		Holocene	
*	1.	Estuary	South Slough pSNA
*	2.	Estuarine Island	Lewis and Clark NWR
*	3.	Sea Arch	Oregon Islands NWR
*	4.	Sea Cave	Cascade Head Preserve Cape Lookout SNA
*	5.	Sea Stack	Harris Beach State Park Oregon Islands NWR
+	6.	Rock Reefs	Orford Reef Siletz Reef
L	7.	Nearshore	
L	8.	Shelf	
L	9.	Slope	
L	10.	Channel	
L	11.	Ridge	
L	12.	Gully	
L	13.	Canyon Wall	
L	14.	Canyon Floor	



Sea Cave at Cascade Head Preserve © Gary Tepfer

MARINE AND ESTUARINE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Invertebrates				
Haliotis kamtschatkana	Pinto abalone	S		
Littorina subrotunda	Newcomb's littorine snail	2	North Spit ACEC	BLM
Fish				
Acipenser medirostris	Green sturgeon	ESA		
Acipenser transmontanus	White sturgeon	S		
Cetorhinus maximus	Basking shark	S		
Eopsetta jordani	Petrale sole	S		
Hemilepidotus hemilepidotus	Red Irish lord	S		
Lampetra ayresii	River lamprey	S		
Oncorhynchus clarkii pop. 1	Coastal cutthroat trout (Oregon Coast ESU)	S		
Oncorhynchus clarkii pop. 2	Coastal cutthroat trout (Southwestern Washington/Columbia River ESU)	1		
Oncorhynchus clarkii pop. 4	Coastal cutthroat trout (Upper Willamette River ESU)	S		
Oncorhynchus clarkii pop. 5	Coastal cutthroat trout (Southern Oregon/California Coasts ESU)	S	New River ACEC	BLM
Oncorhynchus keta pop. 4	Chum salmon (Pacific Coast ESU)	2	Cascade Head (FS)	FS
Oncorhynchus kisutch pop. 1	Coho salmon (Lower Columbia River ESU)	1		
Oncorhynchus kisutch pop. 2	Coho salmon (Southern Oregon/Northern California Coasts ESU)	1	Grassy Knob WA, Elk River WSR, Chetco River WSR, New River ACEC	FWS, FS
Oncorhynchus kisutch pop. 3	Coho salmon (Oregon coast ESU)	1	South Slough NERR, Cascade Head Preserve TNC, Jewell Meadows WMA, Sunset Bay State Park	TNC, OFW, PRD
Oncorhynchus mykiss pop. 25	Steelhead (Klamath Mountains Province ESU, winter run)	2		
Oncorhynchus mykiss pop. 30	Steelhead (Oregon Coast ESU, summer run)	1	Siletz Bay NWR	FWS
Oncorhynchus mykiss pop. 31	Steelhead (Oregon coast winter run)	1	South Slough NERR, Jewell Meadows WMA, Cummins/Gwynn Creeks RNA, Siletz Bay NWR, Nestucca Bay NWR, New River ACEC	BLM OFW, FS, FWS
Oncorhynchus tshawytscha pop. 25	Chinook salmon (Southern Oregon/Northern California Coast ESU, spring run)	S		

MARINE AND ESTUARINE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Oncorhynchus tshawytscha pop. 26	Chinook salmon (Southern Oregon/Northern California Coast ESU, fall run)	2		
Oncorhynchus tshawytscha pop. 27	Chinook salmon (Oregon Coast ESU, spring run)	S		
Platichthys stellatus	Starry flounder	S		
Raja binoculata	Big skate	S		
Raja rhina	Longnose skate	S		
Scorpaenichthys marmoratus	Cabezon	S		
Sebastes alutus	Pacific Ocean perch	S		
Sebastes caurinus	Copper rockfish	S		
Sebastes crameri	Darkblotch rockfish	S		
Sebastes entomelas	Widow rockfish	S		
Sebastes flavidus	Yellowtail rockfish	S		
Sebastes levis	Cowcod	S		
Sebastes maliger	Quillback rockfish	S		
Sebastes melanops	Black rockfish	S		
Sebastes mystinus	Blue rockfish	S		
Sebastes nebulosus	China rockfish	S		
Sebastes paucispinis	Boccacio	S		
Sebastes pinniger	Canary rockfish	S		
Sebastes ruberrimus	Yelloweye rockfish	S		
Squalus acanthias	Spiny dogfish	S		
Thaleichthys pacificus	Eulachon	2		
Reptiles				
Caretta caretta	Loggerhead sea turtle	ESA		
Chelonia mydas	Green sea turtle	ESA		
Dermochelys coriacea	Leatherback turtle	ESA		
Lepidochelys olivacea	Pacific ridley sea turtle	ESA		
Birds				
Brachyamphus marmoratus	Marbled murrelet	2	Peavine Ridge	FS, BLM
Cerorhinca monocerata	Rhinoceros auklet	2	Oregon Islands NWR	FWS
Fratercula cirrhata	Tufted puffin	2	Three Arch Rocks NWR	FWS

MARINE AND ESTUARINE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Oceanodroma furcata	Fork-tailed storm-petrel	2	Oregon Islands NWR	FWS
Pelecanus occidentalis californicus	California brown pelican	2	Oregon Islands NWR, William P. Keady pSNA	FWS
Ptychoramphus aleuticus	Cassin's auklet	2	Oregon Islands NWR	FWS
Mammals				
Balaenoptera acutorostrata	Minke whale	MMPA		
Balaenoptera borealis	Sei whale	ESA		
Balaenoptera musculus	Blue whale	ESA		
Balaenoptera physalus	Fin whale	ESA		
Berardius bairdii	Baird's beaked whale	MMPA		
Callorhinus ursinus	Northern fur seal	MMPA		
Enhydra lutris	Sea otter	2		
Eschrichtius robustus	Gray whale	ESA		
Eubalaena japonica	North Pacific right whale	ESA		
Eumetopias jubatus	Northern sea lion	2	Oregon Islands NWR, Cape Arago State Park, Ecola State Park, Cascade Head Preserve	FWS, PRD, TNC
Globicephala macrorhynchus	Short-finned pilot whale	MMPA		
Histriophoca fasciata	Ribbon seal	MMPA		
Kogia breviceps	Pygmy sperm whale	MMPA		
Lissodelphis borealis	Northern right whale dolphin	MMPA		
Megaptera novaeangliae	Humpback whale	ESA		
Mesoplodon carlhubbsi	Hubbs' beaked whale	MMPA		
Mesoplodon stejnegeri	Stejneger's beaked whale	MMPA		
Mirounga angustirostris	Northern elephant seal	MMPA		
Orcinus orca	Killer whale	ESA		
Phoca vitulina	Harbor seal	MMPA		
Phocoena phocoena	Harbor porpoise	MMPA		
Physeter macrocephalus	Sperm whale	ESA		
Pseudorca crassidens	False killer whale	MMPA		
Zalophus californianus	California sea lion	MMPA		
Ziphius cavirostris	Cuvier's beaked whale	MMPA		

MARINE AND ESTUARINE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Vascular Plants				
Atriplex gmelinii var. *gmelinii*	Gmelin's saltbrush	2		
Chloropyron maritimum ssp. *palustre*	Pt. Reyes bird's-beak	1	Oregon Dunes NRA, Cape Lookout State Park, South Slough pSNA, Netarts Spit SNA, North Spit ACEC	FS, PRD, DSL, BLM
Limonium californicum	Western marsh-rosemary	2	North Spit ACEC	BLM
Phyllospadix serrulatus	Serrulate surf-grass	S		DSL
Sidalcea hendersonii	Henderson's sidalcea	1	Cox Island Preserve	TNC
Stellaria humifusa	Creeping starwort	2		
Algae				
Ahnfeltiopsis leptophylla	Red marine alga	S		DSL
Alaria nana	Brown marine alga	S		DSL
Arthrocardia silvae	Red marine alga	S		DSL
Coilodesme bulligera	Brown marine alga	S		DSL
Cryptonemia borealis	Red marine alga	S		DSL
Cryptopleura peltata	Red marine alga	S		DSL
Desmarestia foliacea	Brown marine alga	S		DSL
Dictyosiphon foeniculaceus	Brown marine alga	S		DSL
Dictyota binghamiae	Brown marine alga	S		DSL
Erythroglossum californicum	Red marine alga	S		DSL
Farlowia compressa	Red marine alga	S		DSL
Farlowia conferta	Red marine alga	S		DSL
Gloiocladia laciniata	Red marine alga	S		DSL
Heterosiphonia densiuscula	Red marine alga	S		DSL
Hollenbergia nigricans	Red marine alga	S		DSL
Hollenbergia subulata	Red marine alga	S		DSL
Hymenena smithii	Red marine alga	S		DSL
Laminaria ephemera	Brown marine alga	S		DSL
Laminaria longipes	Brown marine alga	S		DSL
Loranthophycus californicus	Red marine alga	S		DSL
Macrocystis integrifolia	Brown marine alga	S		DSL
Mazzaella californica	Red marine alga	S		DSL

MARINE AND ESTUARINE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Microcladia coulteri	Red marine alga	S		DSL
Neogastroclonium subarticulatum	Red marine alga	S		DSL
Nitophyllum dotyi	Red marine alga	S		DSL
Pikea pinnata	Red marine alga	S		DSL
Porphyra torta	Red marine alga	S		DSL
Porphyropsis coccinea	Red marine alga	S		DSL
Prasiola linearis	Green marine alga	S		DSL
Pterocladiella caloglossoides	Red marine alga	S		DSL
Pylaiella unilateralis	Brown marine alga	S		DSL
Saundersella simplex	Brown marine alga	S		DSL
Schimmelmannia plumosa	Red marine alga	S		DSL
Scinaia confusa	Red marine alga	S		DSL
Scytosiphon gracilis	Brown marine alga	S		DSL
Scytothamnus fasciculatus	Brown marine alga	S		DSL
Sparlingia pertusa	Red marine alga	S		DSL
Sphacelaria plumigera	Brown marine alga	S		DSL
Ulvaria obscura var. *blytii*	Green marine alga	S		DSL

Stellaria humifusa (Creeping starwart) on the beach near Oceanside.Photo © Paul Slichter

CHAPTER 10. COAST RANGE ECOREGION

The Coast Range Ecoregion includes the entire Oregon coastline and the northern and central Oregon Coast Range Mountains, and extends north through the state of Washington to southwestern British Columbia on Vancouver Island, and south almost to Mendocino, California. Elevations in the Oregon Coast Range Ecoregion range from sea level to 4,000 feet.

The marine climate creates the most moderate and wettest habitats in the state. Average annual rainfall of 60 to 180 inches supports spectacular stands of temperate rainforests. Vegetation is characterized by forests of Sitka spruce, western hemlock, Douglas fir, red alder, coast redwood and tanoak, which are among the fastest growing and most productive forests in the world.

The Oregon coast has other unique ecological features. Sand deposits from coastal streams and rivers (primarily the Umpqua and Columbia Rivers) have created major coastal dune systems, the largest located at the Oregon Dunes National Recreation Area. In the north coast, steep headlands and cliffs are separated by stretches of flat coastal plain and large estuaries. The south coast includes the warmest areas, with rugged headlands and very mild winters, supporting local endemic trees such as the coast redwood and Port Orford cedar and spectacular flowers such as the western lily and Chamber's paintbrush.

Almost 40% of the region is in public ownership, primarily in federal lands administered by the U.S. Forest Service and the Bureau of Land Management, and state lands administered by the Oregon Department of Forestry. Population is dispersed in many small towns, most located within a few miles of the ocean.

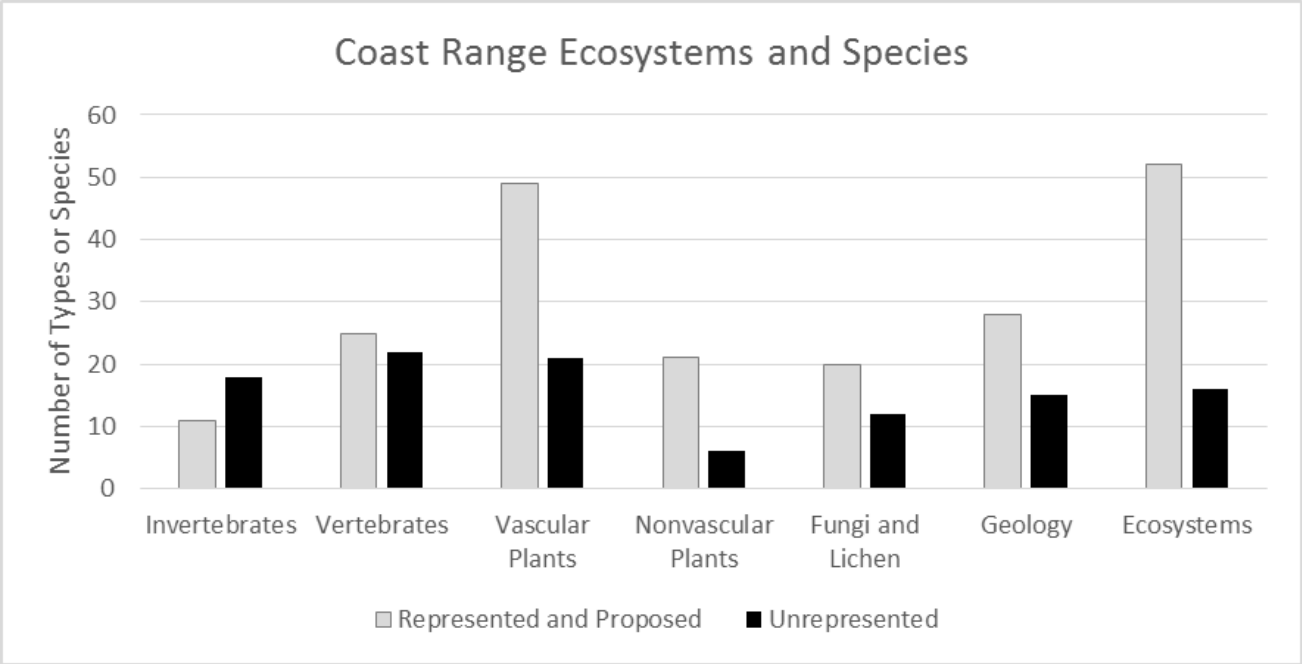


Figure 6. Coast Range Represented and Unrepresented Ecosystems, Geology and Species.

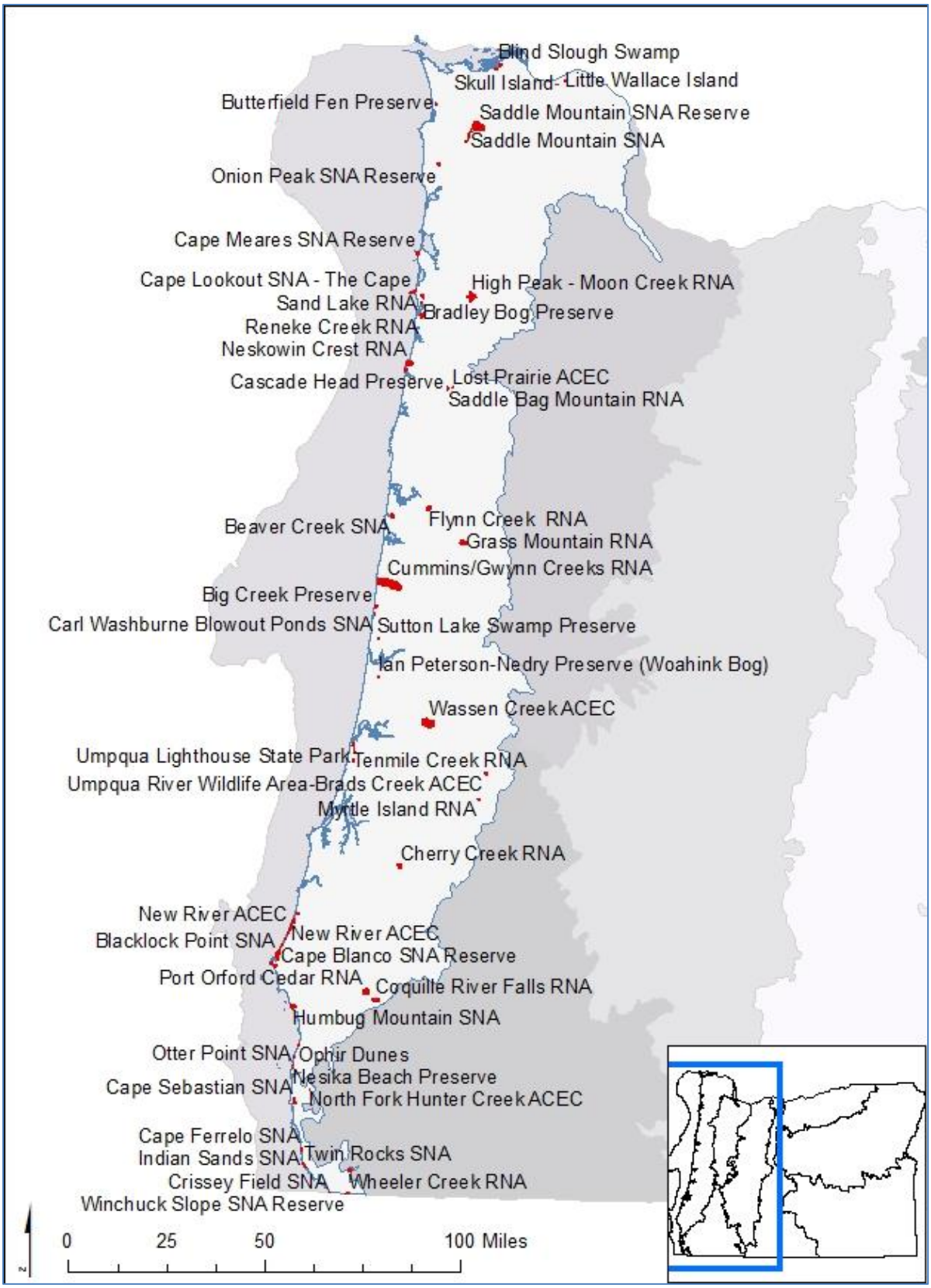


Figure 7. Map of Coast Range Ecoregion Natural Areas.

Forest Analysis

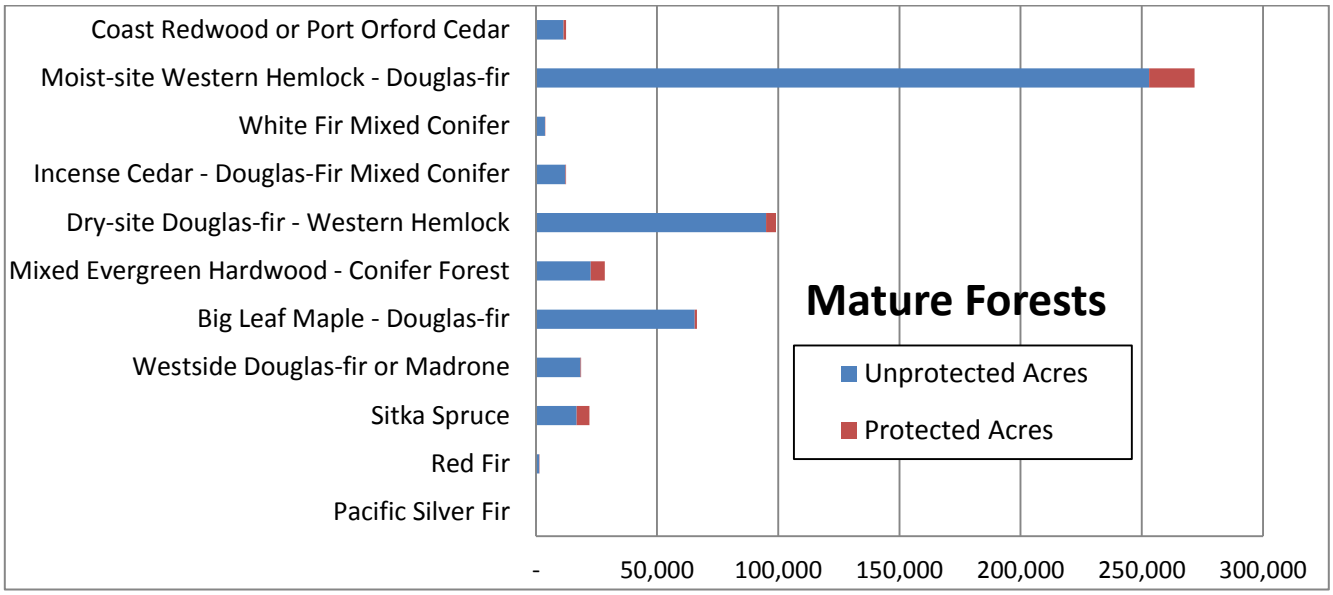


Figure 8. Areas of mature forest types in the Oregon Coast Range on and off protected lands.

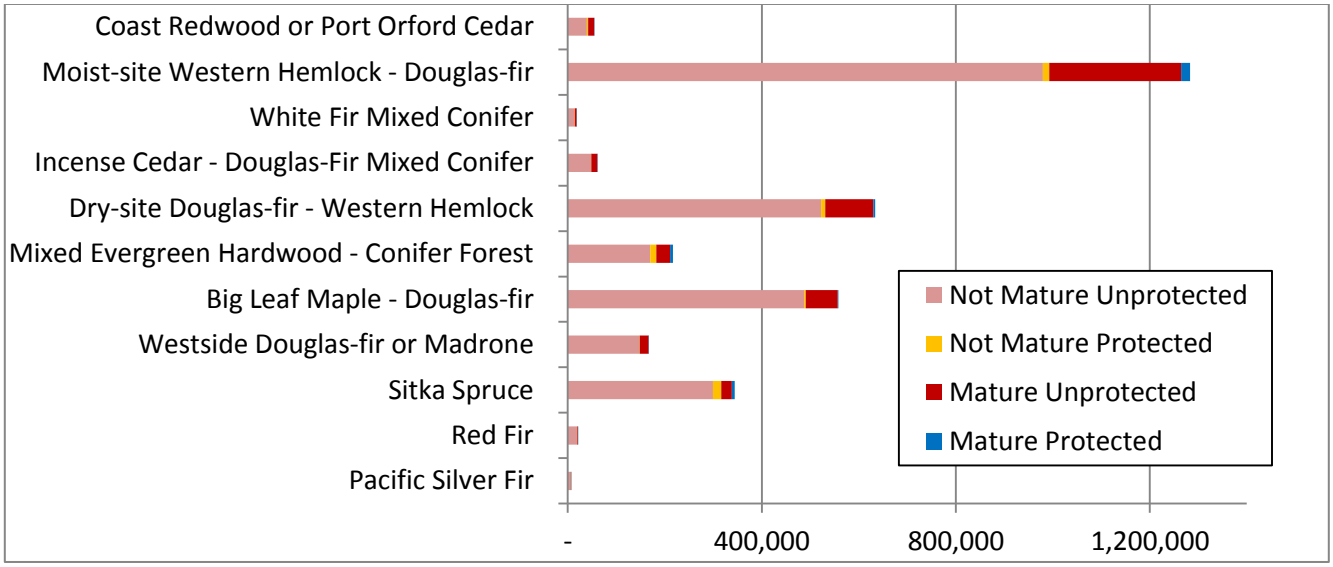


Figure 9. Acreage of total forest types in the Oregon Coast Range on and off protected lands.

The 2010 plan listed 69 ecosystem types in the Coast Range, of which 41 were adequately represented on natural areas. Of the 28 types not adequately represented, only 9 were non-dune forest types. The analysis shows that 22,136 acres of old spruce remain, of which 5,386 are protected. Since spruce is proportionally the best protected forest type in the ecoregion, and the two unrepresented spruce types may be protected in wilderness or on existing protected areas, perhaps a focus on less protected types such as hemlock forests makes more sense.

The majority of unrepresented types are western hemlock forests. There are almost 300,000 acres of old western hemlock – Douglas-fir forests remaining, of which almost 23,000 are protected, yet 5 of the 12 western hemlock associations are not represented in natural areast. Many of these types are quite common, and these should be used to prioritize potential natural areas during any upcoming forest planning process.

Agency	Priority		Ecosystem Name	Present Representation
			Sitka Spruce	
	*	1.	Sitka spruce/salal.	Cape Meares RNA/SNA Cape Lookout pSNA
	*	2.	Sitka spruce/swordfern and Sitka spruce/fool's huckleberry-red huckleberry.	Neskowin Crest RNA Cape Lookout pSNA
FS	H	3.	Sitka spruce/oxalis, with devils club if possible.	*Drift Creek WA*
	*	4.	Sitka spruce/salmonberry.	Cummins Creek RNA Reneke Creek RNA
	*	5.	Grand fir-Sitka spruce forest.	Nesika Beach Preserve TNC
FS	H	6.	Sitka spruce-Port Orford cedar forest on sand.	*South Horsefall Campground*
FS, BLM, PVT	H.	7.	Sitka spruce-western hemlock-Port Orford cedar forest on coastal terrace.	*Coos County Forest*
			Redwood	
	*	8.	Redwood-Douglas fir forest with evergreen shrubs (tanoak, rhododendron, and evergreen huckleberry).	Wheeler Creek RNA
FS	H	9.	Redwood/swordfern and Redwood/forb forest.	*Peavine Ridge, Redwood Nature Trail, Chetco River (FS)*
			Port Orford Cedar	
	*	10.	Douglas fir-western hemlock-Port Orford cedar forest with wet shrubs and forbs.	Port Orford Cedar RNA Coquille River Falls RNA
	*	11.	Port Orford cedar-Douglas fir-western hemlock forest with dry shrubs and forbs.	Port Orford Cedar RNA Coquille River Falls RNA
FS, BLM	H.	12.	Port Orford cedar forest types on ultramafic soils.	Hunter Creek Bog RNA
			Western Hemlock – Douglas fir	
	*	13.	Western hemlock/swordfern.	Cummins Creek RNA High Peak-Moon Creek RNA
	*	14.	Western hemlock/oxalis.	Cherry Creek RNA
FS, BLM	H	15.	Western hemlock/rhododendron/swordfern and western hemlock/rhododendron-salal communities.	
	*	16.	Western hemlock/rhododendron-Oregon grape.	Cherry Creek RNA
FS, BLM	M	17.	Western hemlock/devils club with or without grand fir.	*Bunker Hill*
	*	18.	Western hemlock/vine maple with salmonberry and swordfern.	Flynn Creek RNA
FS	H	19.	Western hemlock/salmonberry, with salal or hazel.	
	*	20.	Western hemlock/evergreen huckleberry.	Cherry Creek RNA
	*	21.	Western hemlock/vine maple-salal.	High Peak-Moon Creek RNA
FS, BLM	H	22.	Western hemlock/Oregon grape, with salal if possible.	
FS	M	23.	Western hemlock/rhododendron-evergreen huckleberry.	*Tahkenitch Area*

Agency	Priority		Ecosystem Name	Present Representation
	*	24.	Noble fir-western hemlock forest.	Grass Mountain RNA Saddle Mountain SNA
	*	25.	Tanoak-Douglas fir/evergreen shrub forest.	Winchuck Slope SNA
	*	26.	Pacific silver fir-western hemlock forest.	Saddle Bag Mountain RNA Onion Peak Preserve NCLC
			Coastal Dunes	
	*	27.	Coastal dune mosaic with tree islands and early successional stages.	Tenmile Creek RNA
	I	28.	Native stabilized dune grassland with red fescue and dune wildrye.	Tenmile Creek RNA Tenmile closure area
	*	29.	Native unstabilized dune grassland with dune bluegrass and seaside lupine.	Sand Lake RNA
	+	30.	Oceanfront herb-dominated dunes with camissonia, knotweed and silvery phacelia.	Ophir Dunes SNA
FS, PRD	H	31.	Douglas fir/Rhododendron-evergreen huckleberry dunes.	*Umpqua Lighthouse State Park*
			Shore Pine Forests and Woodlands	
	*	32.	Sitka spruce-shore pine/evergreen huckleberry.	Tenmile Creek RNA
FS	H	33.	Shore pine/manzanita communities.	*Eel Creek, Bandon SNA*
	*	34.	Shorepine/salal-evergreen huckleberry forest.	Blacklock Point SNA, Cape Blanco SNA
	*	35.	Pygmy shorepine forest on Blacklock soil.	Blacklock Point SNA
		36.	Shorepine-Pacific madrone/wavyleaf silktassel-manzanita	Bandon SNA, New River ACEC
			Grasslands and Shrublands	
	*	37.	Coastal headland grassland and herbaceous complex with red fescue dominant.	Cascade Head Preserve TNC Neskowin Crest RNA
	*	38.	Coastal headland or oceanfront grassland with California oatgrass, red fescue, and Roemer's fescue.	Cape Blanco SNA Crook Point
	*	39.	Coastal headland shrublands with salal, coastal sage or evergreen huckleberry.	Cape Lookout pSNA Cascade Head Preserve TNC
	*	40.	Oceanfront shrublands with crowberry and western azalea.	Blacklock Point SNA, Cape Blanco SNA
	*	41.	Grass bald on Coast Range mountain.	Grass Mountain RNA, Roman Nose pACEC, Saddle Mountain SNA
	*	42.	Rock garden on Coast Range mountain.	Onion Peak Preserve NCLC Saddle Mountain SNA
			Lacustrine	
	*	43.	Dune-blocked lake with aquatic beds and marshy shore, surrounded by unconsolidated sands.	New River ACEC
PRD, PVT, FS, BLM	H	44.	Dune or slump-blocked lake with aquatic beds and marshy shore, surrounded by sedimentary or igneous formations.	

Agency	Priority		Ecosystem Name	Present Representation
			Palustrine	
FS	U	45.	Pond in active sand dune area.	
PRD, FS	U	46.	Pond in stabilized sand dune area.	L Presley and Vera C Gill State Park
	*	47.	Pond at mid to high elevation, including slump ponds.	Wassen Creek ACEC
	*	48.	Sparsely-vegetated deflation plain marsh, with Nevada rush, sickle-leaved rush and springbank clover.	Tenmile Creek RNA
	*	49.	Deflation plain marsh, dominants including slough sedge and silverweed.	Tenmile Creek RNA
	+	50.	Freshwater tidal marsh on lower Columbia River, with streams and mud flats (including Lyngby sedge, hardstem bulrush and narrow-leaved cattail.	Russian Island pRNA
	*	51.	Slough sedge-Sitka sedge fen.	Butterfield Fen (formerly Gearhart Bog, NCLC)
	*	52.	Mid to high elevation sedge fen, sphagnum bog and beaver marsh.	Lost Prairie RNA
	*	53.	Labrador tea/sphagnum mire on organic soils, without Darlingtonia, including associations with shore pine and western red cedar.	Butterfield Fen NCLC, Ian Peterson-Nedry Preserve (TWC)
	*	54.	Labrador tea/sphagnum mire on organic soils, with Darlingtonia, including associations with shore pine and western red cedar.	Ian Peterson-Nedry Preserve (TWC)
	*	55.	Labrador tea/sphagnum mire on floating lake-fill mat.	Nestucca Bay NWR (FWS), Ian Peterson-Nedry Preserve (TWC), New River ACEC
	*	56.	Labrador tea-sweet gale heath.	Butterfield Fen (NCLC)
	+	57.	Bog blueberry/tufted hairgrass brush prairie.	Blacklock Point SNA, New River ACEC
	*	58.	Willow-crabapple/slough sedge swamp with spiraea.	Sutton Lake Preserve TNC
	*	59.	Shore pine/slough sedge seasonal swamp.	Heceta Dunes ACEC
		60.	Cottonwood/willow-redosier dogwood tideland swamp.	Tenasillahe RNA
	*	61.	Sitka spruce/redosier dogwood and willow/redosier dogwood tideland swamps.	Blind Slough Swamp Preserve TNC
PRD, FWS	H	62.	Sitka spruce/skunk cabbage swamp (non-tidal).	*Nestucca Bay NWR (FWS), Ona Beach, Boiler Bay*
FS, BLM	*	63.	Western red cedar-western hemlock/skunk cabbage.	*Upper Rock Creek*
	*	64.	Low elevation pond with aquatic beds and marshy shore.	Port Orford Cedar RNA
	*	65.	Oregon myrtle/evergreen shrub riparian forest.	North Fork Chetco River ACEC
PRD, PVT	H	66.	Shallow lake on ancient deflation plain, with aquatic beds and marshy shore, surrounded by dunes.	
	*	67.	Pacific reedgrass fen.	Cape Blanco SNA
	*	68.	Oregon ash-red alder swamp.	Port Orford Cedar RNA

COAST RANGE GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority	Formation or Feature Name	Present Representation
		Holocene	
*	1.	Baymouth Spit	Netarts Spit SNA
*	2.	Beach Ridges	Fort Stevens State Park
H	3.	Buried Forest	*Neskowin Beach*
*	4.	Dune Sheet	Oregon Dunes NRA Tenmile RNA
+	5.	Dune-dammed Lake	Lake Marie - Umpqua Lighthouse State Park pSNA
M	6.	Landslide	*Newport, Jumpoff Joe*
M	7.	Landslide-dammed Lake	*Lost Lake*
M	8.	Liquefaction Dike	*Marsh Island*
*	9.	Ring Dike, Sill	Ecola State Park
*	10.	Sea Cliff	Cape Kiwanda State Park Cape Blanco SNA
+	11.	Tsunami Deposits	Netarts Bay Cape Lookout – Netarts Spit SNA
	12.	Wave-Cut Terrace	Sunset Bay State Park
		Pleistocene	
*	13.	Cape Blanco Terrace	Cape Blanco SNA Cape Arago State Park
*	14.	Whisky Run Terrace	Cape Arago State Park
*	15.	Pioneer Terrace	Cape Arago State Park
*	16.	Seven Devils Terrace	Cape Arago State Park
*	17.	Metcalf Terrace	Cape Arago State Park
L	18.	Port Orford Formation	*Port Orford*
		Miocene	
*	19.	Cape Foulweather Basalt	Depot Bay State Park
*	20.	Sandstone Of Whale Cove	Depot Bay State Park
*	21.	Depot Bay Basalt	Depot Bay State Park
*	22.	Astoria Formation	Cape Kiwanda State Park
L	23.	Nye Mudstone	*Newport*
*	24.	Empire Formation	Cape Blanco SNA South Slough SNA
		Oligocene	
L	25.	Scappoose Formation	*Manning*

COAST RANGE GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority	Formation or Feature Name	Present Representation
L	26.	Yaquina Formation	*Depot Bay*
		Oligocene and Eocene	
L	27.	Pittsburgh Bluff Formation	*Buxton*
L	28.	Alsea Formation	*Waldport*
		Eocene	
L	29.	Keasey Formation	*Buxton*
L	30.	Cowlitz Formation	*Vernonia*
*	31.	Basalt of Yachats	Sea Lion Point Heceta Head ACEC
L	32.	Nestucca Formation	*Toledo*
*	33.	Tunnel Point Sandstone	Cape Arago State Park
*	34.	Bastendorff Shale	Cape Arago State Park Shore Acres State Park
*	35.	Coaledo Formation	Sunset Bay State Park Shore Acres State Park
L	36.	Bateman Formation	*Elkton*
L	37.	Elkton Formation	*Elkton*
		Cretaceous	
*	38.	Hunters Cove Siltstone	Cape Sebastian State Park
*	39.	Cape Sebastian Siltstone	Cape Sebastian State Park
*	40.	Houstenaden Creek Formation	Samuel H. Boardman State Park
*	41.	Rocky Point Formation	Port Orford State Park
*	42.	Humbug Mountain Conglomerate	Humbug Mountain State Park
*		**Jurassic**	
*	43.	Otter Point Formation	Cape Blanco State Park Otter Point SNA

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Invertebrates				
Anodonta californiensis	California floater (mussel)	2	Lewis & Clark NWR	FWS
Anodonta nuttalliana	Winged floater (mussel)	2		
Bombus occidentalis	Western bumblebee	2		
Callophrys johnsoni	Johnson's hairstreak (butterfly)	2	North Fork Hunter Creek ACEC	BLM
Callophrys polios maritima	Hoary elfin (butterfly)	1	*Driftwood Beach, L. Presley and Vera C Gill State Park*	PRD
Cicindela hirticollis siuslawensis	Siuslaw sand tiger beetle	1	Bandon SNA	PRD
Driloleirus macelfreshi	Oregon giant earthworm	1		
Fluminicola virens	Olympia pebblesnail	2		
Gliabates oregonius	Salamander slug	1		
Gonidea angulata	Western ridged mussel	2		
Hochbergellus hirsutus	Sisters hesperian (snail)	1		
Juga orickensis	Redwood juga (snail)	2		
Juga sp. 3	Brown juga (snail)	1		
Lanx subrotunda	Rotund lanx (snail)	1		
Lepidostoma astaneum	Goeden's lepidostoman caddisfly	2	Flynn Creek RNA	FS
Littorina subrotundata	Newcomb's littorine snail	2		
Lygus oregonae	Oregon plant bug	1	Cape Blanco SNA	PRD
Monadenia fidelis beryllica	Green sideband (snail)	1	Humbug Mountain SNA	PRD
Physella columbiana	Rotund physa (snail)	1		
Plebejus saepiolus littoralis	Insular blue (butterfly)	1	Rock Creek WA	FS
Polites mardon	Mardon skipper (butterfly)	1	North Fork Hunter Creek ACEC	BLM
Pomatiopsis binneyi	Robust walker (snail)	1	*Redwood Creek, Chetco River WSR*	FS
Pomatiopsis californica	Pacific walker (snail)	1		
Pomatiopsis chacei	Marsh walker (snail)	1		
Pristiloma pilsbryi	Crowned tightcoil (snail)	1		
Rhyacophila haddocki	Haddock's rhyacophilan caddisfly	1	Marys Peak ACEC, *Parker Creek headquarters*	BLM
Speyeria zerene bremnerii	Valley silverspot (butterfly)	2-x	Marys Peak ACEC	BLM
Speyeria zerene hippolyta	Oregon silverspot (butterfly)	1	Big Creek Preserve, Cascade Head Preserve, Rock Creek WA, Washburn State Park	TNC, FS
Vorticifex neritoides	Nerite ramshorn (snail)	1		

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Fish				
Entosphenus tridentatus	Pacific lamprey	2		
Oncorhynchus keta pop. 4	Chum salmon (Pacific Coast ESU)	2	Siletz Bay NWR, Nestucca Bay NWR	FWS
Oncorhynchus kisutch pop. 1	Coho salmon (Lower Columbia River ESU)	1	Lewis and Clark NWR	FWS
Oncorhynchus kisutch pop. 2	Coho salmon (Southern Oregon/Northern California Coasts ESU)	1	Grassy Knob WA, Wild Rogue WA	FS
Oncorhynchus kisutch pop. 3	Coho salmon (Oregon Coast ESU)	1	South Slough NERR, Cascade Head Preserve, Jewell Meadows WMA	DSL, TNC, OFW
Oncorhynchus mykiss pop. 25	Steelhead (Klamath Mountains Province ESU, winter run)	2	Elk River WSR, Chetco River WSR, Rogue River WSR	FS
Oncorhynchus mykiss pop. 26	Steelhead (Lower Columbia River ESU, summer run)	1		
Oncorhynchus mykiss pop. 27	Steelhead (Lower Columbia River ESU, winter run)	1		
Oncorhynchus mykiss pop. 30	Steelhead (Oregon Coast ESU, summer run)	1	Siletz Bay NWR	FWS
Oncorhynchus mykiss pop. 31	Steelhead (Oregon Coast ESU, winter run)	1	South Slough NERR, Big Creek Preserve, Cascade Head Preserve, Jewell Meadows WMA	DSL, TNC, OFW
Oncorhynchus mykiss pop. 33	Steelhead (Upper Willamette River ESU, winter run)	1		
Oncorhynchus mykiss pop. 35	Steelhead (Southwest Washington ESU, winter run)	2		
Oncorhynchus tshawytscha pop. 18	Chinook salmon (Deschutes River ESU, summer/fall run)	1		
Oncorhynchus tshawytscha pop. 22	Chinook salmon (Lower Columbia River ESU, fall run)	1	Lewis and Clark NWR	FWS
Oncorhynchus tshawytscha pop. 26	Chinook salmon (Southern Oregon/Northern California Coast ESU, fall run)	2	Chetco River WSR, Rogue River WSR, Elk River WSR	FS
Oregonichthys kalawatseti	Umpqua chub	1		DSL, PVT
Rhinichthys cataractae ssp. 1	Millicoma dace	1	*South Fork Coos River*, West Fork Millicoma River	ODF
Thaleichthys pacificus	Eulachon	2		
Amphibians				
Dicamptodon copei	Cope's giant salamander	2	Saddle Mountain NA	PRD

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Rana boylii	Foothill yellow-legged frog	2	Loeb State Park, Coquille River Falls RNA, Elk River WSR, Grassy Knob WA, Rogue River WSR	PRD, FS
Reptiles				
Actinemys marmorata	Western pond turtle	2	New River ACEC, Oregon Dunes NRA, Tugman State Park, South Slough NERR	FS, PRD, BLM
Birds				
Brachyramphus marmoratus	Marbled murrelet	2	Elk River State Scenic Waterway, Upper Rock Creek ACEC, Euphoria Ridge pACEC, Brownson Ridge pACEC	BLM, USFS, PRD
Branta canadensis occidentalis	Dusky Canada goose	1	Nestucca Bay NWR	FWS
Branta hutchinsii leucopareia	Aleutian Canada goose	2	Cape Lookout State Park, Nestucca Bay NWR, Oregon Islands NWR, Netarts Spit SNA	PRD, FWS
Bucephala albeola	Bufflehead	2		
Charadrius nivosus nivosus	Western snowy plover	2	Bandon NA, Cape Blanco State Park, New River ACEC, Oregon Dunes NRA	PRD, BLM FS
Cygnus buccinator	Trumpeter swan	2		
Elanus leucurus	White-tailed kite	2		
Eremophila alpestris strigata	Streaked horned lark	1		
Falco peregrinus anatum	American peregrine falcon	2	Cape Blanco State Park, Cape Lookout State Park, Oregon Islands NWR, Oswald West State Park, Cape Meares RNA	PRD, FWS
Gymnogyps californianus	California condor	1-x		
Histrionicus histrionicus	Harlequin duck	2		
Melanerpes lewis	Lewis's woodpecker	2		
Podiceps auritus	Horned grebe	2		
Podiceps grisegena	Red-necked grebe	2		
Pooecetes gramineus affinis	Oregon vesper sparrow	2		
Progne subis	Purple martin	2	East Sand Island, Lewis And Clark NWR, Oregon Dunes NRA, Julia Butler Hansen NWR	FWS FS
Strix occidentalis caurina	Northern spotted owl	1	Wheeler Creek RNA, Cherry Creek RNA, Little Sink RNA	BLM
Mammals				
Antrozous pallidus	Pallid bat	2		

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Corynorhinus townsendii	Townsend's big-eared bat	2	Ecola State Park, Boardman State Scenic Corridor	PRD
Eumetopias jubatus	Northern sea lion	2	Cape Arago State Park, Cascade Head Preserve, Ecola State Park, Oregon Islands NWR	PRD, TNC
Martes caurina pop 3	Pacific marten – Coastal population	1		
Myotis thysanodes	Fringed myotis	2	Drift Creek WA, Lewis and Clark NHP	NPS
Odocoileus virginianus leucurus	Columbian white-tailed deer	1	Lewis and Clark NWR	FWS
Pekania pennanti	Fisher	2	Grassy Knob WA	FS
Thomomys bottae detumidus	Pistol River pocket gopher	1		
Thomomys mazama helleri	Gold Beach pocket gopher	1		
Vascular Plants				
Abronia umbellata ssp. *breviflora*	Pink sandverbena	1	Otter Point SNA, New River ACEC, North Spit ACEC	PRD, BLM
Adiantum jordanii	California maiden-hair	2	Rogue River WSR,	FS
Anemone oregana var. *felix*	Bog anemone	2	Lost Forest/Sand Dunes/Fossil Lake ACEC/RNA	BLM
Arctostaphylos hispidula	Gasquet manzanita	2	Pistol River State Scenic Viewpoint	
Artemisia pycnocephala	Coastal sagewort	2	Bandon NA, Oregon Islands NWR, Tenmile Creek RNA, New River ACEC	BLM FWS
Baccharis douglasii	Marsh baccharis	2		
Bensoniella oregana	Bensonia	1		
Brodiaea terrestris	Dwarf brodiaea	2	Cape Arago State Park, New River ACEC, Port Orford Heads State Park	PRD, BLM
Cardamine pattersonii	Saddle Mt. bittercress	1	Onion Peak Preserve, Saddle Mountain SNA	NCLC
Carex brevicaulis	Short-stemmed sedge	2	Lewis And Clark NHP, New River ACEC, Samuel H. Boardman State Scenic Corridor	NPS, BLM
Carex livida	Pale sedge	2		
Carex macrocephala	Bighead sedge	2	Fort Stevens State Park, Del Rey Beach State Recreation Site, Gearhart Ocean State Park, Governor Patterson Memorial State Recreation Area	PRD
Carex macrochaeta	Alaska long-awned sedge	2	Saddle Mountain NA	PRD
Carex pluriflora	Many flowered sedge	2	Butterfield Fen (formerly Gearhart Bog)	NCLC
Castilleja chambersii	Chambers' paintbrush	1	Onion Peak Preserve, *Sugarloaf Mountain*	NCLC

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Castilleja mendocinensis	Mendocino coast paintbrush	1	Otter Point SNA	PRD
Ceratophyllum echinatum	Prickly hornwort	2-x		
Cicendia quadrangularis	Timwort	2	New River ACEC	BLM
Clintonia andrewsiana	Andrew's bead-lily	2-x		
Cochlearia groenlandica	Spoonwort	2	Oregon Islands NWR	FWS
Cryptantha leiocarpa	Seaside cryptantha	2	New River ACEC, Ophir Dunes SNA	BLM ODOT
Delphinium oreganum	Willamette Valley larkspur	1		
Delphinium pavonaceum	Peacock larkspur	1		
Dodecatheon austrofrigidum	Frigid shootingstar	1	Onion Peak Preserve , Saddle Mountain SNA	NCLC, PRD
Ericameria arborescens	Golden fleece	2		
Erigeron peregrinus var. *peregrinus*	Wandering daisy	2	Onion PeakPreserve, Saddle Mountain SNA	NCLC, PRD
Eriophorum chamissonis	Russet cotton-grass	2	L. Presley & Vera C. Gill State Natural Site, New River ACEC, Cape Blanco SNA	BLM ORD
Erysimum concinnum	Pacific wallflower	2	Humbug Mountain State Park	PRD
Erythronium elegans	Coast Range fawn-lily	1	Lost Prairie RNA	BLM
Filipendula occidentalis	Queen-of-the-forest	1	Onion Peak Preserve, Saddle Mountain SNA	NCLC, PRD
Frasera umpquaensis	Umpqua swertia	1		
Fritillaria camschatcensis	Indian rice	2	Lost Prairie RNA	BLM
Geum triflorum var. *campanulatum*	Western red avens	2	Saddle Mountain NA	PRD
Gilia millefoliata	Seaside gilia	1	Sunset Bay pSNA, Crissey Field SNA, New River ACEC	
Hydrocotyle verticillata	Whorled marsh pennywort	2	Oregon Dunes NRA, William M. Tugman State Park	FS, PRD
Iliamna latibracteata	California globe-mallow	1	*Panther Creek*	BLM, FS
Impatiens ecornuta	Spurless jewelweed	2	Blind Slough Swamp Preserve, Ft. Clatsop National Historic Park	TNC, NPS
Lasthenia ornduffii	Large-flowered goldfields	1	Cape Blanco SNA, Otter Point SNA	PRD
Lewisia columbiana var. *rupicola*	Rosy lewisia	2	Onion Peak PreserveSaddle Mountain NA, Onion Peak SNA	NCLC, PRD
Lilium kelloggii	Kellogg's lily	2	*Peavine Ridge*	FS
Lilium occidentale	Western lily	1	Bastendorff Bog (Sunset Bay), New River ACEC, Blacklock Point SNA	PRD
Lycopodiella inundata	Northern bog clubmoss	2	Jessie M. Honeyman Memorial State Park, Oregon Dunes NRA	PRD, FS

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Micranthes hitchcockiana	Saddle Mt. saxifrage	1	Onion Peak Preserve, Saddle Mountain SNA	NCLC, PRD
Microseris bigelovii	Coast microseris	2	Cape Blanco State Park, Oregon Islands NWR, Port Orford Heads State Park	PRD, FWS
Monardella purpurea	Siskiyou monardella	2	*Rocky Peak*	BLM, FS
Oenothera wolfii	Wolf's evening-primrose	1	Humbug Mt. SNA, Otter Point SNA, Cape Blanco SNA	PRD
Ophioglossum pusillum	Adder's-tongue	2	Jessie M. Honeyman Memorial State Park, Oregon Dunes NRA	PRD, FS
Packera flettii	Flett's groundsel	2	Onion Peak Preserve	NCLC
Pellaea andromedifolia	Coffee fern	2		BLM
Phacelia argentea	Silvery phacelia	1	New River ACEC, Crissey Field SNA	BLM
Phacelia malvifolia	Mallow-leaved phacelia	2-x		
Plantago macrocarpa	North pacific plantain	2	Smelt Sands State Recreation Site, Yachats Ocean Road State Natural Site	PRD
Poa unilateralis ssp. *pachypholis*	Ocean bluff grass	1	Cascade Head Preserve	TNC
Polystichum californicum	California sword-fern	2		BLM, DOT
Rhynchospora alba	White beakrush	2	Ian Peterson-Nedry Preserve	TWC
Rhynchospora capitellata	Brownish beakrush	2	Harris Beach State Recreation Area	PRD
Romanzoffia thompsonii	Thompson mistmaiden	1		BLM
Schoenoplectus subterminalis	Water clubrush	2	Jessie M. Honeyman Memorial State Park, New River ACEC, Oregon Dunes NRA	PRD BLM FS
Scoliopus bigelovii	California fetid adder's-tongue	2		
Sidalcea hendersonii	Henderson's sidalcea	1	North Fork Siuslaw Marsh	MRT
Sidalcea hirtipes	Bristly-stemmed sidalcea	1	Neskowin Crest RNA, Cascade Head Preserve, Saddle Mountain SNA	BLM TNC
Sidalcea malachroides	Maple-leaved sidalcea	1-x		
Sidalcea malviflora ssp. *patula*	Coast checker bloom	1	Port Orford State Wayside, Hunter Creek Bog RNA	BLM
Sidalcea nelsoniana	Nelson's sidalcea	1	Walker Flat ACEC, Nestucca River State Scenic Waterway	BLM
Silene douglasii var. *oraria*	Cascade Head catchfly	1	Cascade Head Preserve, Cape Lookout State Park SNA	TNC PRD
Tauschia stricklandii	Strickland's Tauschia	2		
Trillium kurabayashii	Giant purple trillium	2	Rogue River WSR	FS

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Triteleia laxa	Ithuriel's spear	2		FS
Utricularia gibba	Humped bladderwort	2	Jessie M. Honeyman Memorial State Park, Oregon Dunes NRA, New River ACEC, L. Presley and Vira C Gill State Park	PRD, FS
Utricularia minor	Lesser bladderwort	2	New River ACEC	BLM
Wolffia columbiana	Columbia water-meal	2		
Nonvascular Plants				
Anastrophyllum minutum	Liverwort	2		
Barbilophozia barbata	Liverwort	2	Saddle Mountain NA	PRD
Blepharostoma arachnoideum	Liverwort	2		
Bryum calobryoides	Moss	2		
Calypogeia sphagnicola	Liverwort	2	Darlingtonia State Natural Site, New River ACEC	PRD
Campylopus schmidii	Moss	2	Heceta Sand Dunes ACEC/ONA, Oregon Dunes NRA, Sutton Creek Recreation Area	BLM FS PRD
Cephaloziella spinigera	Liverwort	2	Ian Peterson-Nedry Preserve	TWC
Encalypta brevicollis	Moss	2	Saddle Mountain SNA	PRD
Encalypta brevipes	Moss	2	Saddle Mountain NA	PRD
Haplomitrium hookeri	Liverwort	2	Oregon Dunes NRA	FS
Herbertus aduncus ssp. *aduncus*	Liverwort	2	Saddle Mountain NA	PRD
Herbertus dicranus	Liverwort	2	Saddle Mountain NA	PRD
Iwatsukiella leucotricha	Moss	2	Saddle Mountain NA, Onion Peak Preserve	PRD NCLC
Kurzia makinoana	Liverwort	2	New River ACEC	BLM
Limbella fryei	Moss	1	Sutton Lake Preserve, New River ACEC	TNC
Orthodontium gracile	Moss	2	*Peavine Ridge*	FS
Orthodontium pellucens	Moss	2	*Peavine Ridge, Redwood Nature Trail, Bear Ridge*	FS
Phymatoceros phymatodes	Hornwort	2		
Plagiochila semidecurrens var. *semidecurrens*	Liverwort	2	Saddle Mountain NA	PRD
Polytrichum strictum	Hummock haircap moss	2	Butterfield Fen	NCLC
Radula brunnea	Liverwort	2	Saddle Mountain NA	PRD
Radula obtusiloba ssp. *polyclada*	Liverwort	2	Saddle Mountain NA	PRD

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Rhytidium rugosum	Moss	2	Saddle Mountain NA	PRD
Schistochilopsis laxa	Liverwort	2	Ian Peterson-Nedry Preserve, Sand Lake Recreation Area	TWC PRD
Tetraphis geniculata	Moss	2	Valley Of The Giants ONA-ACEC	BLM
Triquetrella californica	Moss	1	Humbug Mountain State Park	PRD
Tritomaria quinquedentata	Liverwort	2	Saddle Mountain NA	PRD
Fungi				
Albatrellus avellaneus	Fungus	1	Cape Sebastian State Scenic Corridor	PRD
Arcangeliella camphorata	Fungus	1	Copper Salmon WA	FS
Calicium adspersum	Lichen	2		
Chamonixia caespitosa	Fungus	2	Cape Perpetua Scenic Area, Mary's Peak ONA/ACEC, Saddle Bag Mountain RNA	FS, BLM
Cladidium bolanderi	Lichen	2	Harris Beach State Recreation Area	PRD
Cortinarius barlowensis	Fungus	2		
Cystangium idahoensis	Fungus	1		
Heterodermia japonica	Lichen	2	Cape Lookout State Natural Area	PRD
Heterodermia sitchensis	Lichen	2	Oregon Dunes NRA, Cape Lookout State Natural Area	FS, PRD
Hypogymnia pulverata	Lichen	2		
Hypogymnia subphysodes	Lichen	2		
Hypotrachyna revoluta	Lichen	2	Cape Arago State Park, Cape Lookout State Park, Shore Acres State Park, Sunset Bay State Park, Ecola State Park	PRD
Leioderma sorediatum	Lichen	2	Heceta Sand Dunes ACEC/ONA, Oregon Dunes NRA, Sutton Creek Recreation Area, South Beach State Park	BLM FS, PRD
Leptogium cyanescens	Lichen	2	Estella Matilda Happ Preserve Sutton Lake Preserve	TWC TNC
Leptonia occidentalis var. *occidentalis*	Fungus	1-X		
Lobaria linita	Lichen	2		
Niebla cephalota	Lichen	2	North Spit ACEC, Oregon Dunes NRA, Cape Arago State Park	BLM FS PRD
Pannaria rubiginella	Lichen	2	Heceta Sand Dunes ACEC/ONA	BLM
Pannaria rubiginosa	Lichen	2	Heceta Sand Dunes ACEC/ONA, Oregon Dunes NRA	FS, BLM

COAST RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Phaeocollybia gregaria	Fungus	1	Saddle Bag Mountain RNA	BLM
Phaeocollybia oregonensis	Fungus	1		
Pilophorus nigricaulis	Lichen	2	Onion Peak SNA, Onion Peak Preserve	DSL, NCLC
Pseudocyphellaria mallota	Lichen	2		
Pseudorhizina californica	Fungus	2	Oregon Dunes NRA	FS
Ramalina pollinaria	Lichen	2	Ecola State Park, New River ACEC, North Spit ACEC, Boardman State Scenic Corridor	PRD, BLM
Ramaria rubella forma blanda	Fungus	2	Oregon Dunes NRA	FS
Rhizopogon clavitisporus	Fungus	2		
Rhizopogon exiguus	Fungus	2		
Sticta arctica	Lichen	2	Saddle Mountain NA	PRD
Teloschistes flavicans	Lichen	2	Cape Lookout State Park, Harris Beach State Recreation Area, Cape Blanco SNA, Cascade Head Preserve TNC	PRD, FS TNC
Thaxterogaster pavelekii	Fungus	1	Cape Lookout State Park	PRD
Usnea nidulans	Lichen	2		

Chamonixia caespitosa, photo by Dan Luoma

CHAPTER 11. WILLAMETTE VALLEY ECOREGION

The Willamette Valley Ecoregion is located between the Coast Range and the Western Cascades in northwestern Oregon and includes Oregon's largest river valley. From Oregon it extends north to include the Vancouver, Washington bottomlands. The valley is characterized by broad, alluvial flats and low basalt hills. Soils include deep alluvial silts from river deposits and dense heavy clays from pluvial deposits in the valley bottom's numerous oxbow lakes and ponds.

The abundant rainfall and fertile soils make the valley Oregon's most important agricultural region. This has been the case since the first settlers began arriving via the Oregon Trail. As a result, the Willamette Valley is Oregon's most developed area. The Willamette Valley is home to most Oregonians, with more than 70% of the state's population, the majority of its industry and almost half of its farmland.

When the first European settlers came to Oregon, the valley was a mosaic of gallery riparian forests and wetlands, open white oak savannas and prairie, with valley margins of oak, ponderosa pine and Douglas fir woodlands. Native Americans maintained the prairies, oak savannas and woodlands by regularly burning most of the valley. With settlement, the prairies have been largely farmed and the open oak savannas and oak-conifer woodlands have been logged or become closed canopy forests due to fire suppression.

The Willamette Valley's location on the Pacific Flyway makes it an important area for migrating and wintering waterfowl. Geese and shorebirds benefit from flooded agricultural lands and the Willamette River and its many tributaries support salmon and steelhead runs, mostly of hatchery origin due to the large number of dams in the system. The valley's few remaining fragments of native prairie support many special plant species and endemic invertebrates, while the remaining wetlands provide habitat to the Oregon chub, the western pond turtle and many other sensitive animal species.

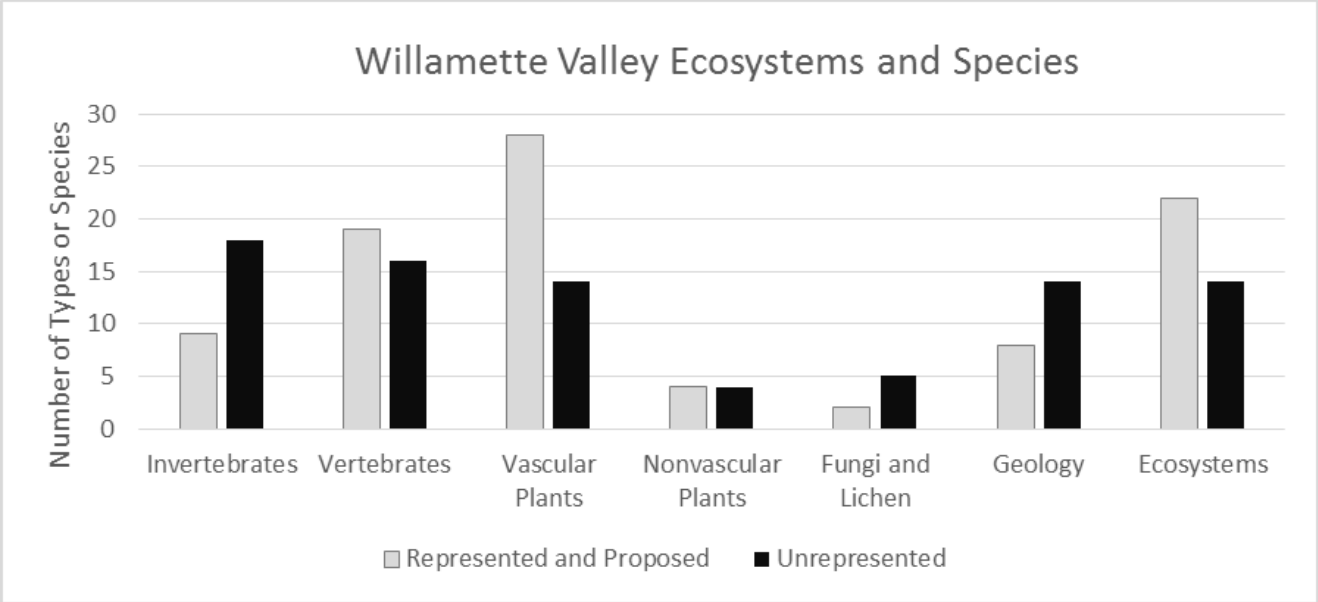


Figure 10. Willamette Valley Represented and Unrepresented Ecosystems and Species.

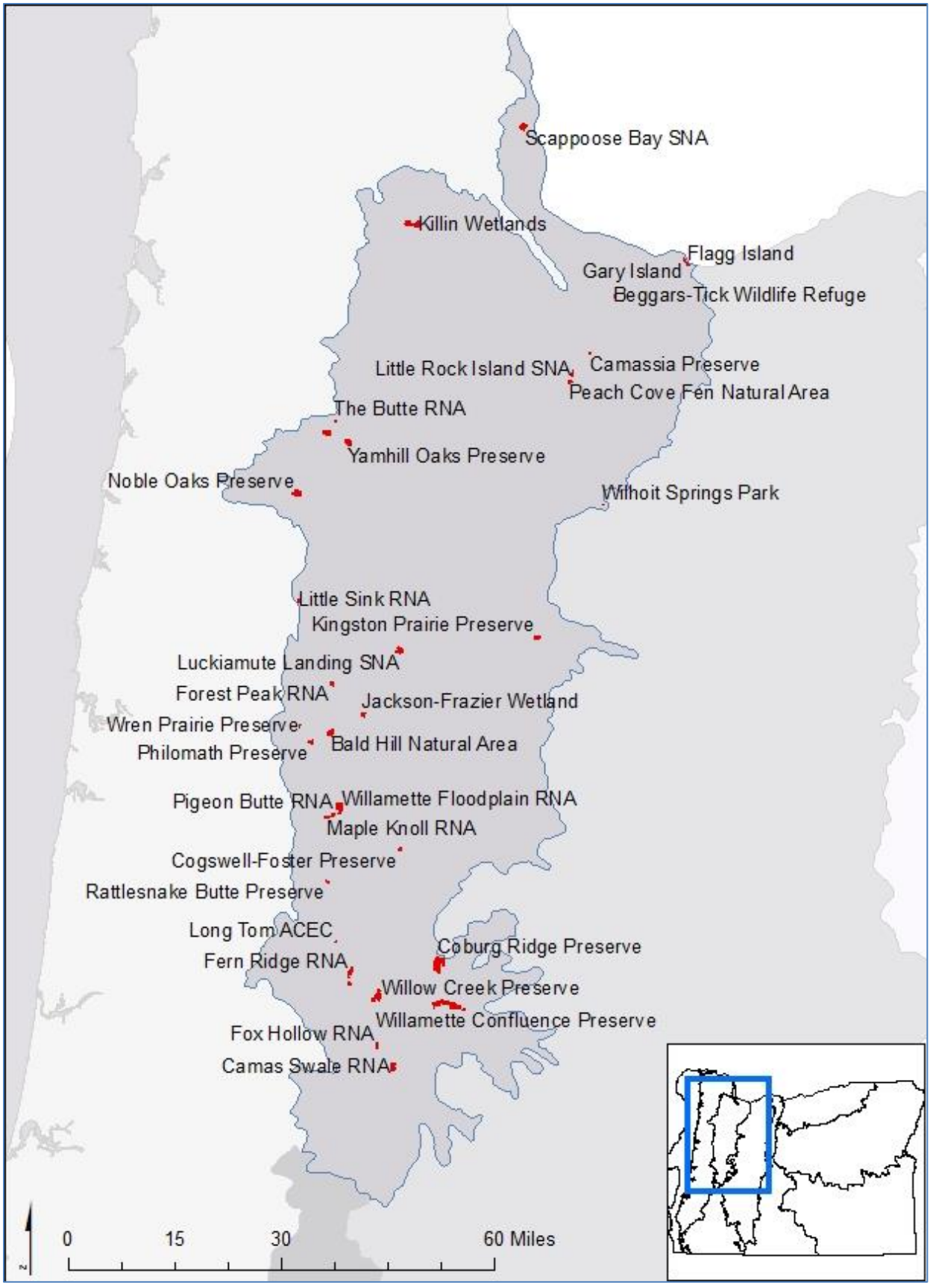


Figure 11. Willamette Valley Ecoregion Natural Areas Map.

WILLAMETTE VALLEY ECOSYSTEMS

Agency	Priority		Ecosystem Name	Present Representation
			Conifer Forests	
	*	1.	Douglas fir/salal/swordfern.	Fox Hollow RNA Camas Swale RNA
	*	2.	Douglas fir/poison oak forest.	The Butte RNA Fox Hollow RNA Forest Peak RNA
	*	3.	Douglas fir-western hemlock/Oregon grape and salal forests, with grand fir if possible.	Mohawk RNA Wilhoit Springs RNA
	*	4.	Ponderosa pine-Douglas fir/California fescue woodland.	Fox Hollow RNA Ponderosa Pine pACEC
	*	5.	Douglas fir-grand fir/vine maple-salal.	Little Sink RNA
	*	6.	Douglas fir – western red cedar-western hemlock/hazel forest on alluvial terrace and slopes.	Sandy River Gorge Preserve TNC Sandy River ACEC
			Mixed Hardwood-Conifer Forests	
	*	7.	Douglas fir-bigleaf maple forest with some grand fir if possible.	Forest Peak RNA The Butte RNA Mohawk RNA
BLM	M	8.	Madrone-Douglas fir-oak woodlands with poison oak and snowberry.	*McCully Mountain* *Fishermen's Bend Campground*
BLM, PVT	H	9.	Oregon white oak-Douglas fir/snowberry woodland.	*McCully Mountain*
	*	10.	Ponderosa pine-Douglas fir-California black oak woodland.	Ponderosa Pine pACEC Fox Hollow RNA
			Hardwood Forests	
	*	11.	Oregon white oak/grass savanna.	The Butte RNA , Wren Prairie Preserve TNC, Baskett Slough NWR
	*	12.	Oregon white oak/poison oak-snowberry/blue wildrye woodland.	Pigeon Butte RNA, Maple Knoll RNA, *Baskett Slough NWR*
BLM, County	H	13.	Oregon white oak-madrone/poison oak/bunchgrass woodland.	*Bald Hill Park* *Howard Buford Recreation Area*
			Prairies	
	*	14.	Roemer fescue valley grassland.	Dorena Prairie ACE, Wren Prairie Preserve TNC, Kingston Prairie Preserve TNC, Basket Slough NWR
	*	15	Lemmon's needlegrass-moss bald.	*Forest Peak RNA* Rattlesnake Butte CTGR
			Riparian Woodlands	
	*	16.	Oregon ash-bigleaf maple-Oregon white oak riparian forest.	Willamette Floodplain RNA Mission Bottom
PVT, PRD	M	17.	White alder bottomland riparian forest.	

Agency	Priority		Ecosystem Name	Present Representation
			Lacustrine	
PRD, PVT, FWS	H	18.	Oxbow lake on Willamette River, with aquatic beds and marshy shore.	*Mission Bottom*
PRD, DSL, OFW	H	19.	Shallow backwater lake on major river floodplain, with associated marsh and mudflats.	*Burlington Bottoms* *Sauvie Island WMA*
			Palustrine	
	*	20.	Slump pond at margin of valley, with aquatic beds.	Little Sink RNA
OFW, PVT	M	21.	Tidal marsh on major river, with associated mud flats (including spikerush, bulrush, burreed and wapato).	
PRD, PVT	M	22.	Wapato marsh (including cutgrass, knotgrass and nodding beggars tick).	*Beggars Tick Marsh* *Sauvie Island*
	*	23.	Slough sedge-one sided sedge marsh.	Fern Ridge RNA Willamette Floodplain RNA
	*	24.	Tufted hairgrass valley bottomland prairie, with vernal pools and brush prairie (including Nootka rose, Douglas spiraea and dwarf blueberry).	Willamette Floodplain RNA Willow Creek Preserve TNC Fern Ridge RNA
	*	25	Tufted hairgrass-California oatgrass bottomland prairie.	Fern Ridge RNA Willow Creek Preserve TNC
	*	26.	Nootka rose/water parsley shrub swamp.	Jackson-Frazier Wetland
PVT	H	27	Geyer willow-Hooker willow shrub swamp.	*Killin Wetlands* (Metro)
	*	28.	Hooker willow-Sitka willow shrub swamp.	Camassia Preserve TNC *Beggars Tick Marsh*
PVT, OFW	M	29.	Pacific willow shrub swamp.	*Government Island, Luckiamute-Little Luckiamute, Rooster Rock, Scappoose Bay, Sauvie Island WMA*
	*	30.	Oregon ash/slough sedge woodland with snowberry.	Willamette Floodplain RNA
FWS, OFW	M	31.	Oregon ash/Pacific willow woodland.	*Luckiamute River*
PRD	M	32.	Riparian area dominated by river and Pacific willow.	*Rooster Rock*
	+	33.	Riparian area dominated by Oregon ash, black cottonwood and redosier dogwood.	Gary, Flagg and Chatham Islands
PVT, PRD	H	34.	Riparian area dominated by Oregon ash, black cottonwood and snowberry.	*Santiam Bar, Multnomah Channel (Sauvie Island), Mission Bottom*
PVT	H	35.	Western red cedar-western hemlock/skunk cabbage swamp.	Possibly extirpated
	*	36.	Columbia sedge marsh.	Smith and Bybee Lakes (Metro)

WILLAMETTE VALLEY GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Holocene	
	M	1.	Meandering Stream	*Tualatin River*
	*	2.	River Terraces	Sandy River Gorge Preserve TNC,Sandy River ACEC, Oxbow Park (Metro)
PVT	H	3.	Talus Caves In Boring Lava Rock Fall	*Carver Caves*
			Pleistocene	
	*	4.	Glacial Erratic	Erratic Rock State Wayside
PVT	L	5.	Portland Hills Silt	*Forest Park*
PVT	L	6.	Willamette Silt	*River Bend*
PVT	L	7.	Cataclysmic Flood Bedforms	*Irvington Bar*
	*	8.	Cataclysmic Flood Scours	Rock Island State Greenway Site
			Pleistocene and Pliocene	
	*	9.	Boring Lava	Rocky Butte State Park, Lewis and Clark State Park
	*	10.	Boring Volcano	Mt. Scott Park
	*	11.	Springwater Terrace Gravel	Milo McIver State Park, Eagle Creek Park
			Pliocene and Miocene	
	*	12.	Troutdale Formation	Oxbow Park, Milo McIver State Park
	*	13.	Sandy River Mudstone	Oxbow Park, Milo McIver State Park
			Miocene	
PVT	L	14.	Molalla Formation	*Molalla*
PVT	L	15.	Wanapum Basalt	*Oregon City*
PVT	L	16.	Grand Ronde Basalt	*Oregon City*
			Oligocene	
	L	17.	Scotts Mills Formation	*Drake Crossing*
			Eocene	
	L	18.	Little Butte Volcanics	*Mollala*
	L	19.	Eugene Formation	*Spores Point*
	L	20.	Fisher Formation	*Eugene*
	L	21.	Spencer Formation	*Eugene*
	L	22.	Yamhill Formation	*McMinnville*

WILLAMETTE VALLEY SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Invertebrates				
Acetropis americana	American grass bug	1	William L. Finley NWR	FWS
Acupalpus punctulatus	Marsh ground beetle	1	William L. Finley NWR	FWS
Anodonta californiensis	California floater (mussel)	2	Sauvie Island WMA	OFW
Anodonta nuttalliana	Winged floater	2		
Callophrys johnsoni	Johnson's hairstreak (butterfly)	1		
Capnia kersti	A stonefly	1	Willow Creek Preserve	TNC
Chloealtis aspasma	Siskiyou short-horned grasshopper	1		
Colligyrus sp. 4	Columbia duskysnail	1		
Cryptomastix devia	Puget oregonian (snail)	1		
Driloleirus macelfreshi	Oregon giant earthworm	1		PRD
Euphydryas editha taylori	Taylor's checkerspot (butterfly)	1	Beazell Memorial Forest, Fitton Green NA	Benton Co.
Fisherola nuttalli	Shortface lanx (= Giant Columbia River limpet)	1		ACE
Fluminicola fuscus	Columbia pebblesnail or spire snail	1		
Fluminicola nuttallianus	Dusky pebblesnail	1		
Fluminicola virens	Olympia pebblesnail	2	Burlington Creek Forest	Metro
Gonidea angulata	Western ridged mussel	2	Sauvie Island WMA	OFW
Juga hemphilli hemphilli	Barren juga (snail)	1		
Juga sp. 3	Brown juga (snail)	1		
Physella columbiana	Rotund physa (snail)	1		
Physella hordacea	Grain physa (snail)	1		
Plebejus icarioides fenderi	Fender's blue (butterfly)	1	Baskett Slough NWR, Willow Creek and Wren Prairie Preserves	TNC, FWS
Pristiloma pilsbryi	Crowned tightcoil (snail)	1		
Pristiloma wascoense	Shiny tightcoil (snail)	2		
Speyeria callippe ssp. 1	Willamette callippe fritillary (butterfly)	1-x		
Speyeria zerene bremnerii	Valley silverspot (butterfly)	2-x		
Vespericola sp. 2	Bald hesperian (snail)	1	Willow Creek Preserve	TNC
Vorticifex neritoides	Nerite ramshorn (snail)	1		
Fish				
Oncorhynchus kisutch pop. 1	Coho salmon (Lower Columbia River ESU)	1	Tryon Creek SNA, Sandy River WSR	PRD, BLM

WILLAMETTE VALLEY SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Oncorhynchus kisutch pop. 3	Coho salmon (Oregon Coast ESU)	1		
Oncorhynchus mykiss pop. 27	Steelhead (Lower Columbia River ESU, winter run)	1	Sauvie Island WMA	OFW
Oncorhynchus mykiss pop. 30	Steelhead (Oregon Coast ESU, summer run)	1		
Oncorhynchus mykiss pop. 31	Steelhead (Oregon Coast ESU, winter run)	1		
Oncorhynchus mykiss pop. 33	Steelhead (Upper Willamette River ESU, winter run)	1	Ankeny NWR, Tualatin River NWR	FWS
Oncorhynchus tshawytscha pop. 21	Chinook salmon (Lower Columbia River ESU, spring run)	1	Sandy River WSR, Sandy River Gorge RNA, Sauvie Island WMA	BLM, OFW
Oncorhynchus tshawytscha pop. 22	Chinook salmon (Lower Columbia River ESU, fall run)	1	Sandy River WSR, Sandy River Gorge RNA, Sauvie Island WMA	BLM, OFW
Oncorhynchus tshawytscha pop. 23	Chinook salmon (Upper Willamette River ESU, spring run)	1	Roaring River WSR, Collawash River WSR	FS
Oregonichthys crameri	Oregon chub	1	Ankeny NWR, William L. Finley NWR, Elijah Bristow State Park, Maple Knoll RNA	FWS, PRD
Salvelinus confluentus pop. 17	Bull trout (Willamette SMU)	1		
Thaleichthys pacificus	Eulachon	2		
Amphibians				
Rana boylii	Foothill yellow-legged frog	2		
Rana pretiosa	Oregon spotted frog	1	William L.Finley NWR	FWS
Reptiles				
Actinemys marmorata	Western pond turtle	2	Ankeny NWR, Elijah Bristow State Park, William L. Finley NWR, Willow Creek Preserve	FWS, PRD, TNC
Chrysemys picta	Painted turtle	2	Ankeny NWR, Champoeg State Heritage Area, Fern Ridge WMA, Sauvie Island WMA, William L. Finley NWR	FWS, PRD
Birds				
Agelaius tricolor	Tricolored blackbird	2		FWS
Ammodramus savannarum	Grasshopper sparrow	2	Baskett Slough NWR, Kingston Prairie Preserve	FS, TNC
Branta canadensis occidentalis	Dusky Canada goose	1		
Branta hutchinsii leucopareia	Aleutian Canada goose	2	Ankeny NWR, Baskett Slough NWR, William L. Finley NWR, Sauvie Island WMA	FWS, OFW
Bucephala albeola	Bufflehead	2		
Coccyzus americanus	Yellow-billed cuckoo	2-x		PVT

WILLAMETTE VALLEY SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Cygnus buccinator	Trumpeter swan	2		
Elanus leucurus	White-tailed kite	2		
Eremophila alpestris strigata	Streaked horned lark	1	Baskett Slough NWR, William L. Finley NWR	FWS
Falco peregrinus anatum	American peregrine falcon	2		
Gymnogyps californianus	California condor	1-x		
Melanerpes lewis	Lewis's woodpecker	2	Sauvie Island WMA	
Podiceps auritus	Horned grebe	2		
Pooecetes gramineus affinis	Oregon vesper sparrow	2	Baskett Slough NWR, Fern Ridge WMA	FWS, OFW
Progne subis	Purple martin	2	Fern Ridge WMA, Sauvie Island WMA, Willamette River Greenway	
Mammals				
Antrozous pallidus	Pallid bat	2		
Corynorhinus townsendii	Townsend's big-eared bat	2	Milo McIver State Park	PRD
Myotis thysanodes	Fringed myotis	2	*Carver Caves,* Clackamas Bluff NA	Metro
Odocoileus virginianus leucurus	Columbian white-tailed deer	1	Burlington Bottoms	BPA
Vascular Plants				
Carex comosa	Bristly sedge	2		
Carex retrorsa	Retrorse sedge	2	Sauvie Island WMA, Rooster Rock SNA	OFW, PRD
Castilleja levisecta	Golden paintbrush	1-x		
Cicendia quadrangularis	Timwort	2	Willow Creek Preserve, Long Tom ACEC	TNC, BLM
Cyperus acuminatus	Short-pointed cyperus	2	Fern Ridge WMA	OFW
Cyperus lupulinus ssp. *lupulinus*	Great Plains flatsedge	2		
Delphinium leucophaeum	White rock larkspur	1	Camassia Preserve, Little Rock Island, Champoeg State Heritage Park, Elk Rock, Peach Cove Fen	TNC, PRD, PPR Metro
Delphinium nuttallii	Nuttall's larkspur	2	Columbia Gorge NSA	FS
Delphinium oreganum	Willamette Valley larkspur	1	North Santiam State Recreation Area	PRD
Delphinium pavonaceum	Peacock larkspur	1	Willamette Floodplain RNA, William L. Finley NWR	FWS
Erigeron decumbens	Willamette Valley daisy	1	Fern Ridge RNA, William L. Finley NWR, Baskett Slough NWR	ACE, FWS

WILLAMETTE VALLEY SPECIAL SPECIES

Scientific Name	Common Name	List	Representation	Agency
Eucephalus vialis	Wayside aster	1	Camas Swale RNA, Camas Swale ACEC, Willow Creek Preserve	BLM, TNC
Horkelia congesta ssp. *congesta*	Shaggy horkelia	1	Fern Ridge RNA, Long Tom ACEC, Willow Creek Preserve	ACE, BLM, TNC
Howellia aquatilis	Howellia	1	William L. Finley NWR, Peach Cove Fen Natural Area	FWS, Metro
Hydrocotyle verticillata	Whorled marsh pennywort	2		
Iris tenax var. *gormanii*	Gorman's iris	1		
Lathyrus holochlorus	Thin-leaved peavine	1	William L. Finley NWR, Ankeny NWR	FWS
Lipocarpha micrantha	Small-flowered lipocarpha	2		
Lomatium bradshawii	Bradshaw's lomatium	1	Fern Ridge RNA, Long Tom ACEC, Willamette Floodplain RNA	ACE, BLM, FWS
Lupinus oreganus	Kincaid's lupine	1	Cogswell Foster Preserve TNC, Baskett Slough NWR, William L. Finley NWR	TNC, FWS
Mimulus tricolor	Three-colored monkeyflower	2	Ankeny NWR, Cogswell Foster Preserve TNC, Willamette River Greenway, William L. Finley NWR	FWS, TNC, PRD
Navarretia willamettensis	Willamette navarretia	1	Fern Ridge RNA, Fern Ridge WMA	ACE, OFW
Pellaea andromedifolia	Coffee fern	2		
Penstemon hesperius	Rydberg's penstemon	1	Tualatin NWR	FWS
Pyrrocoma racemosa var. *racemosa*	Racemose pyrrocoma	2	Fern Ridge RNA	ACE
Rhynchospora alba	White beakrush	2		
Romanzoffia thompsonii	Thompson mistmaiden	1		ACE, BLM
Rorippa columbiae	Columbia cress	1	Columbia Gorge NSA	FS
Rotala ramosior	Toothcup	2		PVT
Scirpus pendulus	Drooping bulrush	2		FWS, ACE
Sedella pumila	Sierra mock-stonecrop	2		BLM
Sericocarpus rigidus	White-topped aster	1	Fern Ridge RNA, Kingston Prairie Preserve	BLM, TNC
Sidalcea hirtipes	Bristly-stemmed sidalcea	1		
Sidalcea nelsoniana	Nelson's sidalcea	1	Willamette Prairie RNA, Wren Prairie PreserveTNC, William L. Finley NWR	BLM, TNC, FWS
Sisyrinchium hitchcockii	Hitchcock's blue-eyed grass	1	Willow Creek Preserve	TNC

Scientific Name	Common Name	List	Representation	Agency
Sullivantia oregana	Oregon sullivantia	1	Crown Point, Rooster Rock State Park	PRD
Taraxia ovata	Golden eggs	2	Coyote Spencer Wetlands, William L. Finley NWR	MRT, FWS
Trillium albidum ssp. *parviflorum*	Giant white wakerobin	1	Camassia Preserve	TNC
Utricularia gibba	Humped bladderwort	2	Fern Ridge WMA, Fern Ridge Dam, Killin Wetlands	OFW, ACE, Metro
Utricularia minor	Lesser bladderwort	2		
Wolffia borealis	Dotted water-meal	2	Little Sink RNA	BLM
Wolffia columbiana	Columbia water-meal	2	Killin Wetlands, Smith and Bybee Lakes, Willamette Park Corvallis	Metro, PPR
Nonvascular Plants				
Bruchia flexuosa	Moss	2	Willow Creek Preserve, Fern Ridge RNA, Fern Ridge WMA	TNC, ACE, OFW
Ephemerum crassinervium	Moss	2	Fern Ridge WMA	OFW
Ephemerum serratum	Moss	2	Willow Creek Preserve, Fern Ridge RNA, Fern Ridge WMA	TNC, ACE, OFW
Micromitrium synoicum	Moss	2		
Phymatoceros phymatodes	Hornwort	2		
Physcomitrella patens	Moss	2	Sauvie Island WMA, William L. Finley NWR	OFW, FWS
Preissia quadrata	Liverwort	2		
Sphaerocarpos hians	Liverwort	1	Avery Park	City
Fungi				
Calicium adspersum	Lichen	2	Little Sink RNA	BLM
Leptonia occidentalis var. *occidentalis*	Fungus	1-X		
Lobaria linita	Lichen	2	Little Sink RNA	BLM
Phaeocollybia gregaria	Fungus	1		
Pseudorhizina californica	Fungus	2		
Rhizopogon subradicatus	Fungus	2-x		
Urnula craterium	Fungus	2-x		

CHAPTER 12. KLAMATH MOUNTAINS ECOREGION

The Klamath Mountains Ecoregion covers most of southwestern Oregon and northwestern California and includes the Siskiyou Mountains, California's Marble Mountains and Trinity Alps and the interior valleys and foothills between these mountain ranges. Oregon elevations are from 100 to over 7,500 feet. The ecoregion also has major climatic extremes. Far western portions receive more than 100 inches of rain per year, with relatively mild temperatures year-round. The southern interior valleys are much drier, with locations receiving less than 20 inches of rain per year and summer high temperatures averaging more than 90° F.

The Ecoregion has the oldest landscapes in Oregon, representing the only large area of the state not shaped primarily by volcanism. It also is by far the most geologically diverse region, having large areas of metamorphic and sedimentary rocks such as serpentine, limestone and gabbro, as well as granite and basalt. Topography ranges from steep, dissected mountains and canyons to gentle foothills and flat valley bottoms.

The combination of exceptional climatic, geologic and topographic diversity supports the most diverse habitats in Oregon. In addition, the Klamath Mountain Ecoregion is a floristic crossroads, including elements of the Sierra Nevada Mountains, Sacramento Valley and Coast Range Mountains of California; the Cascade Mountains of Oregon and Washington; and the Great Basin to the east. Its geologic age, stable climate, and unusual geology result in the Ecoregion being a major center of species endemism for vascular plants. Of the 4,000 native plant species or subspecies occurring in Oregon, about half are found in this ecoregion with about a quarter of these known only here. The region is also known for its diversity of conifers, with 30 different species. In Oregon, the West Cascades has the second largest number of conifer species, with 18 species.

Prior to European settlement, the landscape was dominated by Douglas fir forests, oak woodlands and ponderosa pine woodlands. There were native grasslands and chaparral on the valley bottoms, and diverse conifer and mixed hardwood forests. All of the natural habitats have changed since fire suppression became effective in the early twentieth century. The region has a high frequency of dry, summer lightning storms, leading to natural fire frequency of less than 40 years for most of the region, and closer to 20 years in the valleys and eastern portions of the region. Over 50 years of fire suppression have dramatically altered the ecology of the forests, savannas and shrublands in this region.

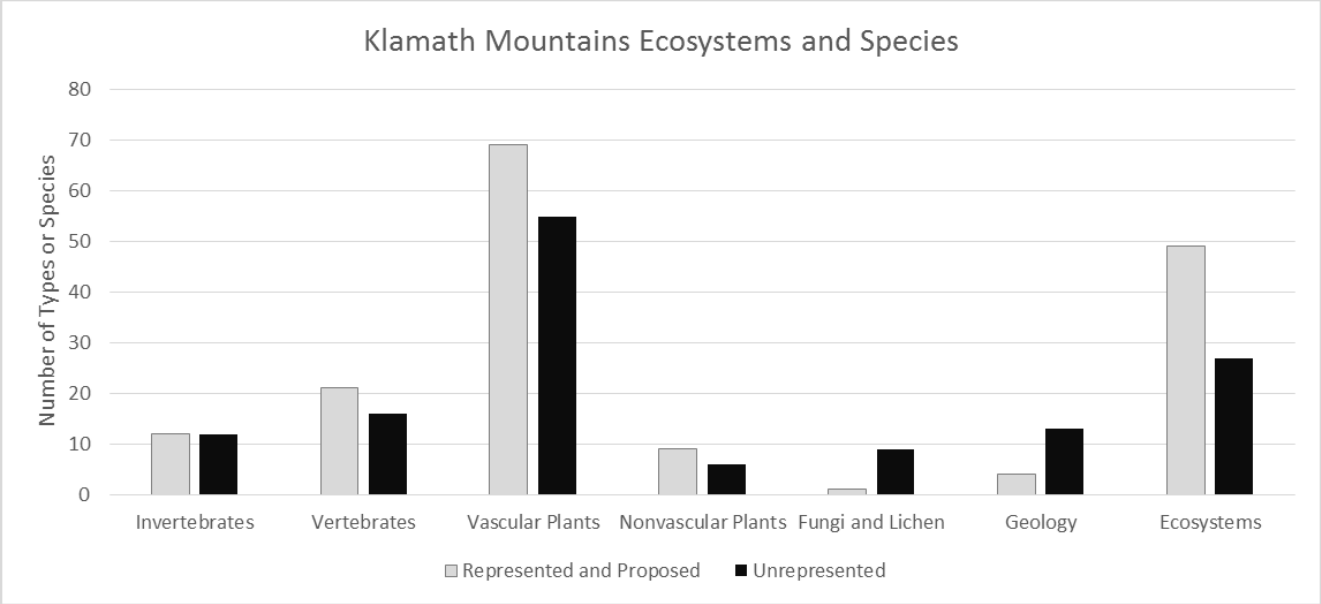


Figure 12. Represented and Unrepresented Ecosystems, Geologic Types and Species for the Klamath Mountains Ecoregion.

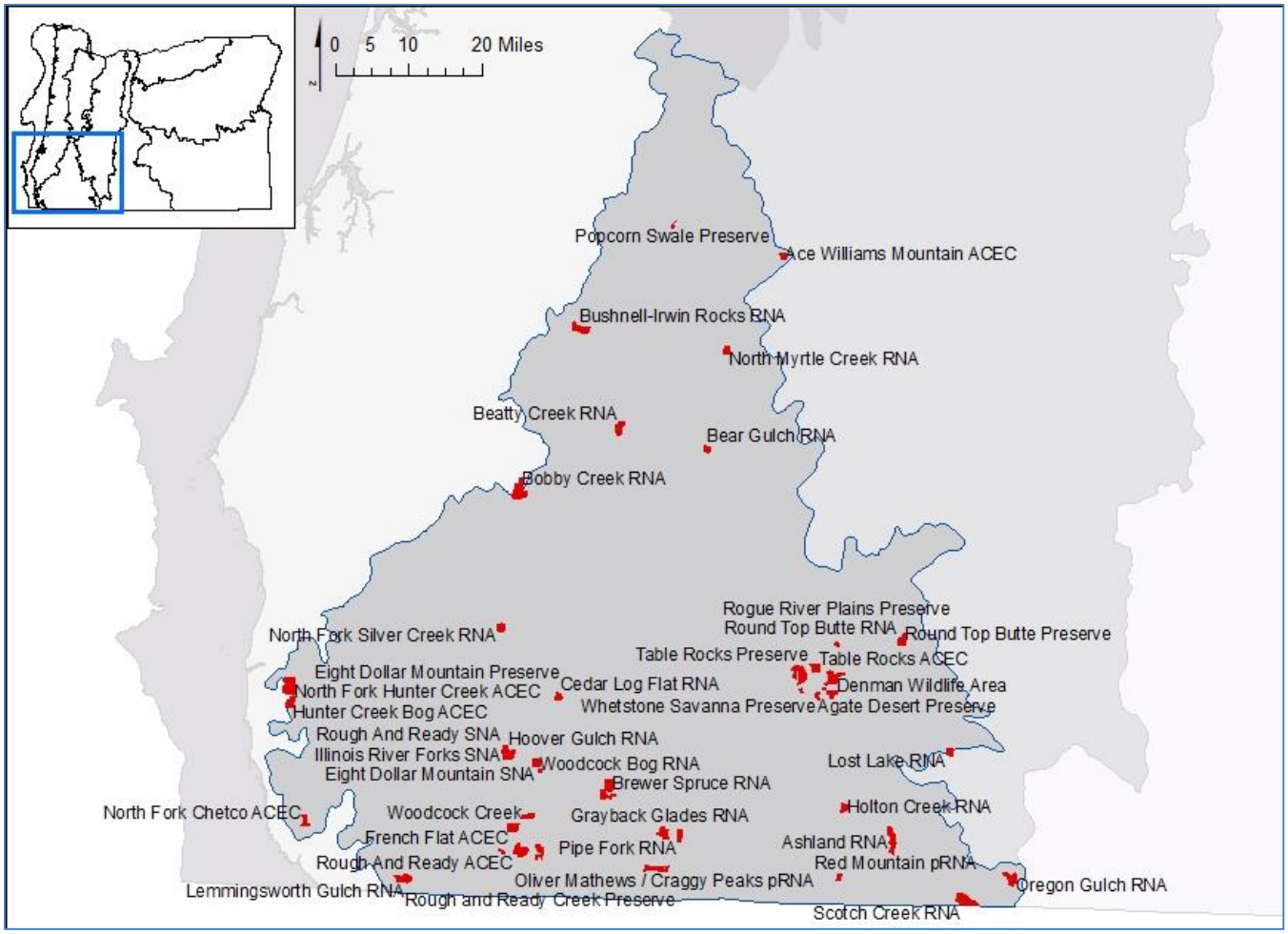


Figure 13. Klamath Mountains Ecoregion Natural Areas map.

Forest Analysis

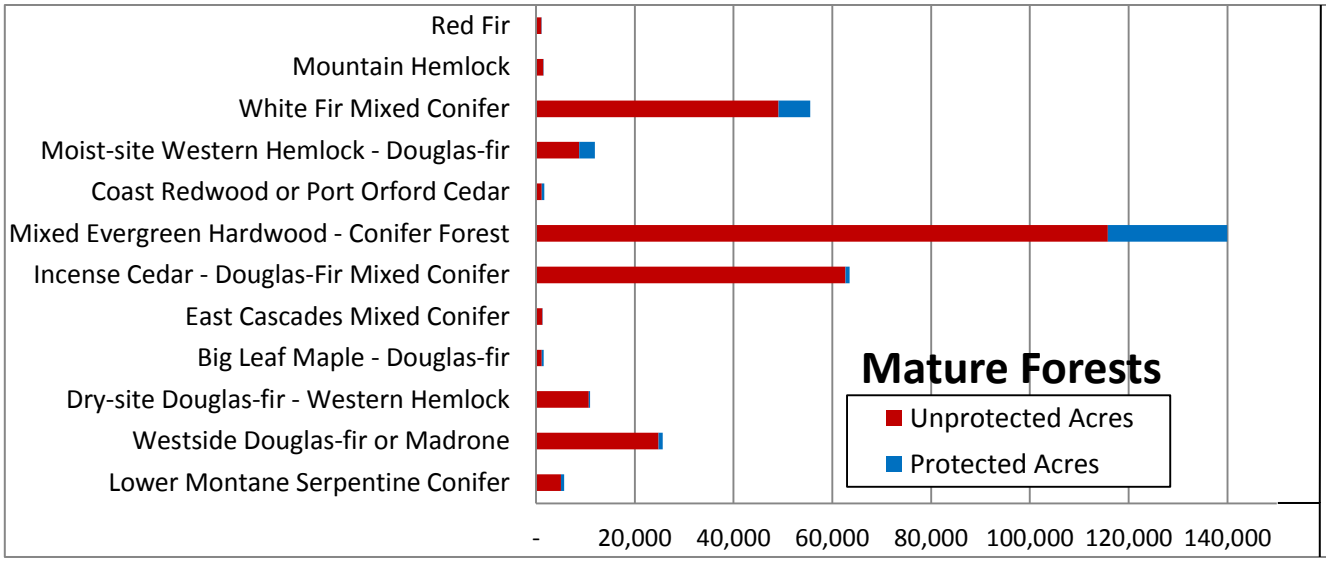


Figure 14. Area of protected and unprotected mature forests in the Klamath Mountains Ecoregion.

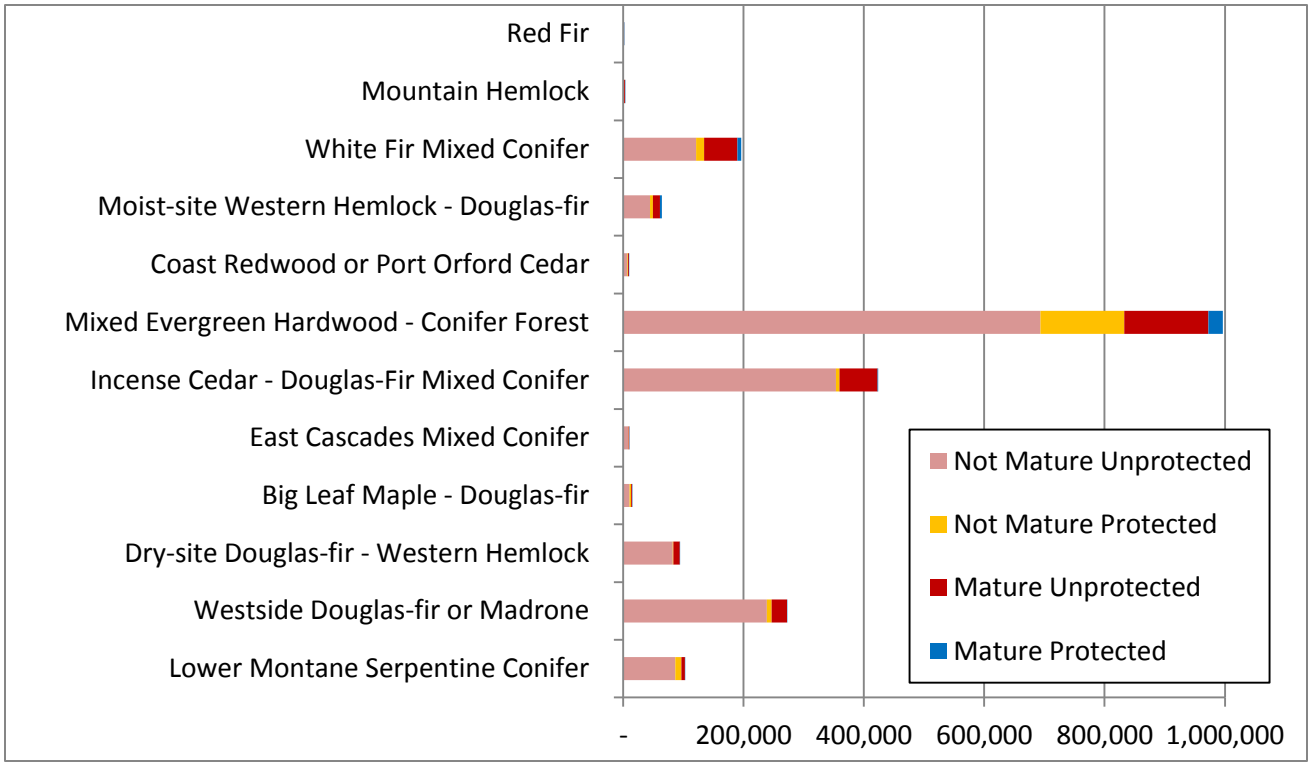


Figure 15. Acreage of total forest types in the Oregon Coast Range on and off protected lands.

The 2010 plan listed 81 ecosystem types in the Klamath Mountains, of which 42 were adequately represented on natural areas. Of the 39 types not adequately represented, only 28 were forest types, and of these, only 21 were non-serpentine conifer forest types. As was the case with the Coast Range, the plan is most deficient in the Western Hemlock types, with none of the 5 ecosystem types designated in the plan occurring on protected areas. According to the analysis, there are almost no moist-site western hemlock forests left, which may mean opportunities for natural areas to be designated with examples of these are very limited, and should be sought. If none can be found, these moist-site western hemlock forest types should be removed from the plan. There are about 11,000 acres of dry-site hemlock-fir left, meaning that there is more opportunity to protect at least one example of each of the unrepresented types.

The analysis shows that there is very little Shasta Red Fir or Mountain Hemlock remaining in older conditions in this ecoregion, so perhaps some of the unrepresented higher-elevation types should be removed from the Klamath Mountains list, since they are better represented in the Cascades. However, the most significant types that are not included in any of the ecoregional ecosystem lists are the types representing the SW Oregon incense cedar – Douglas fir – mixed conifer forests. These are the low-elevation, Ponderosa pine - Douglas-fir - incense cedar forests and the mid-elevation mixed conifer forests with sugar pine and incense cedar. These still contain about 63,500 of old forest, of which less than 830 acres are protected, mostly at Ashland RNA. These should be priorities for additional natural area designations.

The last important under-represented ecological system is the grand fir low elevation mixed conifer (East Cascades Mixed Conifer Ecological System), at the eastern side of the ecoregion. Only 1,300 acres of the type remain in old forest conditions, and only 4 acres are protected, so perhaps a site could be identified including the remaining lands, which may be able to include some sugar pine forests as well.

Agency	Priority		Ecosystem Name	Present Representation
			Oregon White Oak	
	*	1.	Oregon white oak savanna or open woodland with forbs or grasses.	Round Top Butte Preserve TNC/RNA, Bushnell-Irwin Rockes ACEC, Whetstone Savanna Preserve TNC
	*	2.	Oregon white oak-Douglas fir-madrone/poison oak woodland.	Bushnell-Irwin Rocks ACEC Fawn Butte pRNA
			Port Orford Cedar	
FS, BLM	H	3.	Port Orford cedar/huckleberry oak/beargrass on ultramafic soils.	
	*	4.	Port Orford cedar-white fir/Oregon grape and Port Orford cedar-tanoak/salal communities.	Pipe Fork RNA
	*	5.	Port Orford cedar-western hemlock with leucothe and swordfern.	North Fork Silver Creek RNA
	*	6.	Port Orford cedar/hairy honeysuckle/fescue on ultramafic soils.	Lemmingsworth Gulch RNA Cedar Log Flat RNA
FS, BLM	H	7.	Port Orford cedar maritime types with evergreen huckleberry/swordfern or rhododendron-salal.	
			Ponderosa Pine	
	*	8.	Ponderosa pine-Douglas fir moist forest.	Ashland RNA
	*	9.	Ponderosa pine-white oak woodland.	Round Top Butte Preserve RNA-TNC French Flat RNA, Fawn Butte pRNA
	*	10.	Ponderosa pine-black oak woodland.	Table Rocks Preserve TNC / BLM
BLM	H	11.	Western juniper-Oregon white oak-Ponderosa pine/buckbrush/bunchgrass savanna.	Siskiyou Pass pACEC
			Douglas Fir	
	+	12.	Douglas fir serpentine woodland.	Eight Dollar Mtn ACEC/pSNA Lemmingsworth Gulch RNA
FS, BLM	M	13.	Douglas fir/pinemat manzanita.	
FS, BLM	M	14.	Douglas fir forest with salal, oceanspray and/or swordfern.	
	*	15.	Douglas fir/canyon live oak woodland with poison oak and dwarf Oregon grape if possible.	Bear Gulch RNA Hoover Gulch RNA
FS, BLM	H	16.	Douglas fir-California black oak/poison oak.	French Flat RNA
	*	17.	Douglas fir-Ponderosa pine forest with poison oak, hairy snowberry or Piper's Oregon grape understory.	North Myrtle Creek RNA Oregon Gulch RNA
FS, BLM	H	18.	Douglas fir/oceanspray or dry shrub community.	
			Western Hemlock	
FS	M	19.	Western hemlock-white fir forest with dwarf Oregon grape.	
FS, BLM	H	20.	Western hemlock/salal/swordfern and western hemlock/vine maple-salal with western red cedar.	

Agency	Priority		Ecosystem Name	Present Representation
FS, BLM	M	21.	Western hemlock-tanoak/Pacific rhododendron, western hemlock-incense cedar/salal or western hemlock/salal-dwarf Oregon grape assocations.	Bobby Creek RNA
FS, BLM	M	22.	Western hemlock coastal communities with California laurel, evergreen huckleberry and swordfern.	
			Tan Oak	
	*	23.	Tanoak on ultramafics with shrub understory.	Lemmingsworth Gulch RNA
	*	24.	Tanoak - Douglas fir dry site forest with canyon live oak, dwarf Oregon grape and poison oak if possible.	Hoover Gulch RNA Lemmingsworth Gulch RNA
	*	25.	Moist tanoak forests (tanoak-bigleaf maple-canyon live oak/swordfern, tanoak-Port Orford cedar/ salal, and tanoak/evergreen huckleberry-rhododendron-salal).	Bobby Creek RNA
FS, BLM	H	26.	Tanoak-western hemlock/evergreen huckleberry forest with swordfern if possible.	
		27.	Tanoak-Douglas fir moist forest with evergreen huckleberry, salal and dwarf Oregon grape.	Bobby Creek RNA
FS	H	28.	Tanoak on ultramafics with sugar pine and golden chinkapin.	
FS	L	29.	Tanoak with white fir and Sadler's oak at a cool site.	
			White Fir	
FS, BLM	M	30.	White fir/pinemat manzanita on shallow soil.	
FS	L	31.	White fir-tanoak/prince's pine forest.	
	*	32.	White fir at high elevations (white fir-red fir/Sadler oak or vanilla leaf or prince's-pine-threeleaf anemone and whitefir/beargrass associations).	Grayback Glades RNA
	*	33.	White fir/dwarf Oregon grape moderately dry site forest with twinflower and vanilla leaf if possible.	North Fork Silver Creek RNA North Myrtle Creek RNA
	*	34.	White fir, moderately dry site forest with baldhip rose, hairy snowberry and starflower if possible.	Oregon Gulch RNA
	*	35.	White fir moist site forest with rhododendron, dwarf Oregon grape, and twinflower.	Holton Creek RNA
FS, BLM	M	36.	White fir/Sadler oak on ultramafics.	
	*	37.	White fir with Brewer spruce and Alaska yellow cedar if possible.	Brewer Spruce RNA Oliver Mathews pRNA
			Red Fir – Mountain Hemlock	
	+	38.	Red fir-mountain hemlock/pinemat manzanita/prince's pine.	Oliver Mathews pRNA
	+	39.	Red fir-white fir/baldhip rose/one-sided pyrola.	Oliver Mathews pRNA
FS	M	40.	Red fir-white fir/Sadler oak/one-sided pyrola or prince's pine.	
FS	M	41.	Red fir/mountain sweetroot.	
	+	42.	Mountain hemlock/herb association.	Oliver Mathews pRNA

Agency	Priority		Ecosystem Name	Present Representation
			Serpentine Pine	
	*	43.	Knobcone pine forest.	Lemmingsworth Gulch RNA, North Fork Hunter Creek ACEC
	*	44.	Jeffrey pine grassland savanna.	Beatty Creek RNA, Cedar Log Flat RNA, North Fork Hunter Creek ACEC
BLM, FS	M	45.	Jeffrey pine with incense cedar and dry shrubs.	*Eight Dollar Mtn pSNA/ACEC*
FS, BLM DSL	M	46.	Jeffrey pine/huckleberry oak-pinemat manzanita forest with box-leaved silk-tassel if possible.	*Eight Dollar Mtn pSNA/ACEC*
	+	47.	Western white pine/beargrass.	Lemmingsworth Gulch RNA, Red Mountain pRNA
	+	48.	Western white pine/huckleberry oak/beargrass with tanoak and Jeffrey pine if possible.	Lemmingsworth Gulch RNA Red Mountain pRNA
			Chaparral	
BLM	H	49.	Manzanita-wedgeleaf ceanothus/bunchgrass chaparral.	
	*	50.	Sticky manzanita-gray manzanita serpentine chaparral.	Rough & Ready Creek Preserve ACEC/TNC
	*	51.	Live oak/Fremont silk-tassel-birchleaf mountain mahogany/bunchgrass.	Cascade-Siskiyou NM
	*	52.	Birchleaf mountain mahogany-ceanothus-rosaceous mixed chaparral.	Scotch Creek RNA
			Grasslands	
	+	53.	Baker cypress woodland.	Oliver Mathews pRNA, Baker Cypress ACEC
	*	54.	Bluebunch wheatgrass-California oatgrass-Lemmon's needlegrass slopes.	Round Top Butte Preserve TNC/RNA
PVT, BLM	H	55.	Idaho fescue-junegrass-Lemmon's needlegrass non-serpentine grassland.	
	*	56.	Coastal oak-conifer woodland and meadow mosaic.	North Fork Hunter Creek ACEC
			Lacustrine	
FS, BLM	U	57.	Dune or slump-blocked lake with aquatic beds and marshy shore.	
	*	58.	Valley floor vernal pools on hardpan.	Table Rocks RNA Agate Desert Preserve TNC
	*	59.	Vernal pools on basaltic andesite.	Table Rocks RNA Poverty Flat ACEC
	*	60.	Lower to upper montane lake with aquatic beds and marshy shore, on serpentine or peridotite.	Red Mountain pRNA
			Palustrine	
	*	61.	Douglas fir-bigleaf maple forest.	North Myrtle Creek RNA

KLAMATH MOUNTAINS ECOSYSTEMS

Agency	Priority	Ecosystem Name	Present Representation
FS, BLM	M	62. Riparian hardwoods with ash and black cottonwood.	
PVT, BLM	H	63. Alluvial terrace with ash, Oregon white oak and Ponderosa pine.	
	*	64. High elevation alder glade.	Grayback Glades RNA
	*	65. Riparian hardwood forest along a major river (with alder, bigleaf maple and myrtle).	North Fork Chetco River RNA Myrtle Island RNA
	*	66. Mid to high elevation pond with aquatic beds and marshy shore.	Brewer Spruce RNA
	+	67. Mid to high elevation vernal ponds and large cold springs.	Oliver Mathews pRNA
FS	L	68. Tufted hairgrass-sedge wetland.	
	*	69. Tufted hairgrass-California oatgrass bottomland seasonally flooded prairie.	Round Top Butte Preserve RNA/TNC French Flat RNA
	*	70. Mire on floating lake-fill mat.	
	*	71. Hillslope wetland with willow and saussurea.	Oregon Caves NM
FS	U	72. Montane fen and wet mountain meadow complex.	
	*	73. Darlingtonia fen on serpentine-peridotite, with western azalea and camas along margins.	Lemmingsworth Gulch RNA Woodcock Bog RNA
	*	74. Darlingtonia fen on serpentine-peridotite, with Port Orford cedar.	Hunter Creek Bog RNA
	*	75. Riparian on serpentine-peridotite, with Port Orford cedar, western azalea and darlingtonia.	Kalmiopsis WA
	*	76. California laurel riparian forest.	North Fork Chetco River RNA

Serpentine-peridotite ridge with Jeffrey Pine savanna in the Siskiyou Mountains. ORBIC photo.

KLAMATH MOUNTAINS GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Quaternary	
	*	1.	Limestone Caves	Oregon Caves NM
	*	2.	River Gorge	Mule Creek Canyon Rogue WSR
			Eocene	
PVT	L	3.	Tyee Formation	*Reston*
PVT	L	4.	Camas Valley Formation	*Reston*
PVT	L	5.	White Tail Ridge Formation	*Reston*
PVT	L	6.	Tenmile Formation	*Reston*
PVT	L	7.	Bushnell Rock Formation	*Reston*
			Eocene and Paleocene	
PVT	L	8.	Siletz River Volcanics	*Reston*
			Cretaceous	
	*	9.	Days Creek Formation	Eight Dollar Mountain SIA/ACEC
			Cretaceous and Jurassic	
BLM, FS	M	10.	Riddle Formation	*Days Creek*
PVT	L	11.	Dothan Formation	*Winston*
			Jurassic	
FS	M	12.	Colebrooke Schist	
FS	L	13.	Coast Range Ophiolite	*Riddle*
BLM, FS	M	14.	Galice Formation	*Galice*
	*	15.	Rogue Formation	Rogue River WSR (by Glendale)
BLM, FS	M	16.	Josephine Ophiolite	*Cave Junction*
			Jurassic and Triassic	
	L	17.	May Creek Schist	*Evans Creek*

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Invertebrates				
Bombus franklini	Franklin's bumblebee	1	Bear Creek Greenway, Rogue River Trail	Jackson Co.
Bombus occidentalis	Western bumblebee	2	Cascade-Siskiyou NM, Bear Creek Greenway	Jackson Co., BLM
Branchinecta lynchi	Vernal pool fairy shrimp	1	Lower Table Rock ACEC, Table Rocks RNA, Whetstone Savanna Preserve TNC, Denman WMA	BLM, TNC, OFW
Callophrys johnsoni	Johnson's hairstreak (butterfly)	1	Cascade-Siskiyou NM	BLM
Chloealtis aspasma	Siskiyou short-horned grasshopper	1	Cascade-Siskiyou NM	BLM
Dumontia oregonensis	A water flea	2	Denman WMA	OFW
Fluminicola sp. 19	Keene Creek pebblesnail	1	Cascade-Siskiyou NM	BLM
Helminthoglypta hertleini	Oregon shoulderband (snail)	1		
Hesperia colorado oregonia	Oregon branded skipper (butterfly)	2	Cascade-Siskiyou NM	BLM
Juga sp. 2	Blue Mountains juga (snail)	1		
Juga sp. 3	Brown juga (snail)	1		
Lanx alta	Highcap lanx (snail)	1		
Lanx subrotunda	Rotund lanx (snail)	1		BLM
Monadenia fidelis beryllica	Green sideband (snail)	1		
Monadenia fidelis celeuthia	Traveling sideband (snail)	1	Whetstone Savanna Preserve	TNC
Plebejus podarce klamathensis	Gray blue (butterfly)	2		
Polites mardon	Mardon skipper (butterfly)	1	Cascade-Siskiyou NM	BLM
Pomatiopsis binneyi	Robust walker (snail)	1		
Pomatiopsis chacei	Marsh walker (snail)	1		
Prophysaon sp. 1	Klamath tail-dropper (slug)	1		
Rhyacophila colonus	O'Brien rhyacophilan caddisfly	1		
Speyeria coronis coronis	Coronis fritillary (butterfly)	2	Rough & Ready Flat SIA, Cascade-Siskiyou NM, Illinois River WSR	TNC, BLM, FS
Stygobromus oregonensis	Oregon Cave amphipod	1	Oregon Caves NM	NPS
Vespericola sierranus	Siskiyou hesperian (snail)	1		
Fish				
Catostomus rimiculus pop. 1	Jenny Creek sucker	1	Cascade-Siskiyou NM	BLM
Entosphenus tridentatus	Pacific lamprey	2		

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Oncorhynchus kisutch pop. 2	Coho salmon (Southern Oregon/Northern California Coasts ESU)	1	Rogue River WSR, Chetco River WSR, Illinois River WSR, Wild Rogue WA	BLM, FS
Oncorhynchus kisutch pop. 3	Coho salmon (Oregon Coast ESU)	1	Canyon Creek Forest SNA	PRD
Oncorhynchus mykiss pop. 24	Steelhead (Klamath Mountains Province ESU, summer run)	2	Rogue River WSR, Chetco River WSR, Illinois River WSR, Wild Rogue WA	BLM, FS
Oncorhynchus mykiss pop. 25	Steelhead (Klamath Mountains Province ESU, winter run)	2	Rogue River WSR, Chetco River WSR, Illinois River WSR, Wild Rogue WA, Smith River WSR	BLM, FS
Oncorhynchus mykiss pop. 30	Steelhead (Oregon Coast ESU, summer run)	1		
Oncorhynchus mykiss pop. 31	Steelhead (Oregon Coast ESU, winter run)	1	North Myrtle Creek RNA, Canyon Creek Forest SNA	BLM, PRD
Oncorhynchus tshawytscha pop. 26	Chinook salmon (Southern Oregon/Northern California Coast ESU, fall run)	2	Rogue River WSR, Chetco River WSR, Illinois River WSR, Wild Rogue WA	BLM, FS
Oregonichthys kalawatseti	Umpqua chub	1	*Cow Creek Reservation*	*BIA*
Amphibians				
Aneides flavipunctatus	Black salamander	2	Ashland RNA	FS
Plethodon stormi	Siskiyou Mountains salamander	1		BLM
Rana boylii	Foothill yellow-legged frog	2	Cascade-Siskiyou NM, Illinois River State Scenic Waterway, Kalmiopsis WA, Popcorn Swale Preserve, Rogue River Wild & Scenic River, Rough & Ready Creek Preserve.	PRD, FS, TNC, BLM
Reptiles				
Actinemys marmorata	Western pond turtle	2	Denman WMA, Kalmiopsis WA, Lost Lake RNA, Rogue River State Scenic Waterway.	FS, BLM
Birds				
Agelaius tricolor	Tricolored blackbird	2	Denman WMA	
Ammodramus savannarum	Grasshopper sparrow	2		
Brachyramphus marmoratus	Marbled murrelet	2	*Peavine Ridge*	
Branta hutchinsii leucopareia	Aleutian Canada goose	2		BLM
Bucephala albeola	Bufflehead	2		
Elanus leucurus	White-tailed kite	2		
Eremophila alpestris strigata	Streaked horned lark	1		

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Falco peregrinus anatum	American peregrine falcon	2	Brewer Spruce RNA, Cascade-Siskiyou NM, Kalmiopsis WA, Wild Rogue WA, Rogue River State Scenic Waterway.	FS, BLM
Gymnogyps californianus	California condor	1-x		
Melanerpes lewis	Lewis's woodpecker	2	Denman WMA, Table Rocks Preserve, Touvelle State Recreation Site	TNC, PRD
Picoides albolarvatus	White-headed woodpecker	2		
Pooecetes gramineus affinis	Oregon vesper sparrow	2		
Progne subis	Purple martin	2		BLM
Strix occidentalis caurina	Northern spotted owl	1	Ashland RNA, Bear Gulch ACEC, Bear Gulch RNA, Cascade-Siskiyou NM, Oregon Caves NM, Rogue WSR	BLM, FS, NPS
Mammals				
Antrozous pallidus	Pallid bat	2	Cascade-Siskiyou NM	BLM
Canis lupus	Gray wolf	2	Cascade-Siskiyou NM, Sky Lakes WA	BLM, FS
Corynorhinus townsendii	Townsend's big-eared bat	2	Kalmiopsis WA, Oregon Caves NM, Rogue River State Scenic Waterway, Table Rocks ONA	NPS, FS, BLM
Lynx canadensis	Canada lynx	2		
Martes caurina pop 3	Pacific marten - Coastal population	1	Rogue River WSR	FS
Myotis thysanodes	Fringed myotis	2	Oregon Caves NM, Pipe Fork RNA, Ashland RNA	NPS, BLM, FS
Odocoileus virginianus leucurus	Columbian white-tailed deer	1	North Bank Habitat Area	BLM
Pekania pennanti	Fisher	2	Cascade-Siskiyou NM	BLM
Ursus arctos horribilis	Grizzly bear	2-x		
Vascular Plants				
Adiantum jordanii	California maiden-hair	2	Illiniois River WSR	FS
Agrostis hendersonii	Henderson's bentgrass	1-x		
Allium peninsulare	Peninsular onion	2	Cascade-Siskiyou NM	BLM
Androsace elongata ssp. *acuta*	Long-stemmed androsace	2-x		
Arabis koehleri var. *koehleri*	Koehler's rockcress	1	North Bank ACEC	BLM
Arabis macdonaldiana	Red Mountain rockcress	1	Kalmiopsis WA, Rough & Ready Flat SIA	FS
Arabis modesta	Rogue Canyon rockcress	2	Rogue River State Scenic Waterway	BLM

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Arctostaphylos hispidula	Gasquet manzanita	2	Green Knob SIA, Kalmiopsis WA, North Fork Hunter Creek ACEC	FS, BLM
Astragalus californicus	California milk-vetch	2	Cascade-Siskiyou NM, Scotch Creek RNA	BLM
Astragalus gambelianus	Gambel milk-vetch	2	Cascade-Siskiyou NM, Scotch Creek RNA	BLM
Balsamorhiza hookeri var. *lanata*	Woolly balsamroot	1	Cascade-Siskiyou NM	BLM
Bensoniella oregana	Bensonia	1	Bear Camp SIA	FS
Bulbostylis capillaris	Densetuft hairsedge	2-x		
Callitriche marginata	Winged water-starwort	2	Table Rocks RNA	BLM
Calochortus coxii	Cox's mariposa-lily	1	*Ridge above Myrtle Creek*	BLM
Calochortus greenei	Greene's mariposa-lily	1	Cascade Siskiyou NM	BLM
Calochortus howellii	Howell's mariposa-lily	1	Woodcock Bog RNA, Eight Dollar Mountain ACEC, Oregon Mountain SIA	BLM, FS
Calochortus indecorus	Sexton Mt. mariposa-lily	1-X		
Calochortus nudus	Shasta star-tulip	2		FS
Calochortus persistens	Siskiyou mariposa lily	1		BLM
Calochortus umpquaensis ssp. *confertus*	Umpqua mariposa-lily	1		BLM
Calochortus upquaensis ssp. *flavicomus*	Umpqua mariposa-lily	1	*Callahan Ridge, Ace Williams Mt.*	BLM
Camassia howellii	Howell's camassia	1		BLM
Carex comosa	Bristly sedge	2		
Carex klamathensis	Klamath sedge	1	Eight Dollar Mountain Preserve and ACEC, Woodcock Bog RNA	TNC, BLM
Carex nervina	Sierra nerved sedge	2		FS
Castilleja schizotricha	Split-hair paintbrush	2	Red Mountain RNA	FS
Cheilanthes covillei	Coville’s lipfern	2		
Cheilanthes intertexta	Coastal lipfern	2	Cascade-Siskiyou NM, Oregon Gulch RNA, Scotch Creek RNA, Soda Mountain WA	BLM
Chlorogalum angustifolium	Narrow-leaved amole	2		BLM
Cicendia quadrangularis	Timwort	2		BLM
Corydalis aquae-gelidae	Cold-water corydalis	1		
Cryptantha milo-bakeri	Milo Baker's cryptantha	2		BLM, FS
Cyperus acuminatus	Short-pointed cyperus	2		
Cypripedium fasciculatum	Clustered lady's-slipper	2	Cascade-Siskiyou NM, Kalmiopsis WA, Scotch Creek RNA	BLM

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Delphinium nudicaule	Red larkspur	2	Cascade-Siskiyou NM, Rogue River Wild & Scenic River	BLM
Delphinium nuttallii	Nuttall's larkspur	2	Cascade-Siskiyou NM, Soda Mountain WA	BLM
Dicentra pauciflora	Few-flowered bleedingheart	2	Hinkle Lake SIA	FS
Draba howellii	Howell's whitlow-grass	2	Big Craggies SIA, Brewer Spruce RNA, Hinkle Lake SIA	BLM, FS
Enemion occidentale	Western false rue-anemone	2		
Epilobium oreganum	Oregon willow-herb	1	Cedar Log Flat RNA, Woodcock Bog RNA, Oregon Mountain SIA	BLM, FS
Epilobium siskiyouense	Siskiyou willow-herb	1	Observaton Peak, Dutchman Peak SIA	FS
Ericameria arborescens	Golden fleece	2	Kalmiopsis WA, Chetco River WSR	FS
Erigeron cervinus	Siskiyou daisy	2	Babyfoot Lake Botanical Interest Area, Grayback Mt SIA, Kalmiopsis WA, Red Flat SIA	FS
Erigeron petrophilus	Cliff daisy	2	Oliver Mathews pRNA	BLM
Eriogonum lobbii	Lobb's buckwheat	2	Big Craggies SIA	FS
Erodium macrophyllum	Large-leaved filaree	1		BLM
Erythronium howellii	Howell's adder's-tongue	1	Eight Dollar Mountain SIA	FS
Eschscholzia caespitosa	Gold poppy	2		BLM
Frasera umpquaensis	Umpqua swertia	1	Bear Camp SIA	FS
Fritillaria gentneri	Gentner's fritillaria	1	Cascades Siskiyou NM	BLM
Fritillaria purdyi	Purdy's fritillaria	2		
Gentiana plurisetosa	Bristly gentian	1	Grayback Mountain SIA	FS
Gentiana setigera	Waldo gentian	1	Lemmingsworth Gulch RNA, Woodcock Bog RNA	BLM
Hackelia bella	Beautiful stickseed	2		
Hastingsia bracteosa var. *atropurpurea*	Purple flowered rush-lily	1	Rough & Ready Flat SIA, Woodcock Bog RNA	BLM, FS
Hastingsia bracteosa var. *bracteosa*	Large-flowered rush-lily	1	Eight Dollar Mountain ACEC, Rough & Ready Flat SIA/ACEC	BLM, FS
Hesperocyparis bakeri	Baker's cypress	2	Grayback Mountain SIA, Miller Lake SIA, Baker Cypress ACEC	FS, BLM
Hieracium horridum	Shaggy hawkweed	2		
Horkelia congesta ssp. *congesta*	Shaggy horkelia	1		BLM
Horkelia hendersonii	Henderson's horkelia	1		FS
Horkelia tridentata ssp. *tridentata*	Three-toothed horkelia	2	Ashland RNA	FS

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Iliamna latibracteata	California globe-mallow	1		BLM, FS
Keckiella lemmonii	Bush beardtongue	2		BLM, FS
Lewisia leeana	Lee's lewisia	2	Grayback Mt SIA	FS
Lilium kelloggii	Kellogg's lily	2		
Limnanthes alba ssp. *gracilis*	Slender meadow-foam	1	Illinois River Forks State Park	PRD
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadow-foam	1	Cascade-Siskiyou NM, Soda Mountain WA	BLM
Limnanthes pumila ssp. *grandiflora*	Big-flowered wooly meadow-foam	1	Agate Desert Preserve, Whetstone Savanna Preserve	TNC
Limnanthes pumila ssp. *pumila*	Dwarf wooly meadow-foam	1	Table Rocks RNA and Preserve	BLM, TNC
Lomatium cookii	Agate Desert lomatium	1	Agate Desert Preserve, French Flat ACEC, Whetstone Savanna Preserve, Woodcock Bog RNA	BLM, TNC
Lomatium engelmannii	Engelmann's desert-parsley	2	Chrome Ridge SIA	FS
Lotus stipularis	Stipuled trefoil	2		BLM, FS
Lupinus lepidus var. *ashlandensis*	Mt. Ashland lupine	1	*Mt. Ashland*	FS
Lupinus oreganus	Kincaid's lupine	1		BLM, FS
Lupinus tracyi	Tracy's lupine	2	Babyfoot Lake Botanical Interest Area, Kalmiopsis WA	FS
Meconella oregana	White meconella	1	Table Rocks Preserve, Table Rocks ACEC	TNC, BLM
Microseris douglasii ssp. *douglasii*	Douglas' microseris	2-x		
Mimulus bolanderi	Bolander's monkeyflower	2		BLM, FS
Mimulus congdonii	Congdon's monkeyflower	2		
Monardella purpurea	Siskiyou monardella	2	Kalmiopsis WA, Lemmingsworth Gulch RNA, Rough & Ready Flat SIA, Rogue River Wild & Scenic River, Rocky Peak ACEC	FS, BLM
Nemacladus capillaris	Slender nemacladus	2	Cascade-Siskiyou NM, Oregon Gulch RNA	BLM
Pellaea andromedifolia	Coffee fern	2	North Bank ACEC	BLM
Pellaea mucronata ssp. *californica*	California bird's-foot cliffbrake	2		BLM
Perideridia erythrorhiza	Red-root yampah	1	Eight Dollar Mountain SIA	FS
Phacelia leonis	Siskiyou phacelia	1		FS
Pilularia americana	American pillwort	2	Agate Desert Preserve	TNC
Plagiobothrys austiniae	Austin's plagiobothrys	2		

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Plagiobothrys figuratus ssp. *corallicarpus*	Coral seeded allocarya	1	Whetstone Savanna Preserve	TNC
Plagiobothrys greenei	Greene's popcorn flower	2	Table Rocks RNA	BLM
Plagiobothrys hirtus	Rough popcorn flower	1	Popcorn Swale Preserve	TNC
Plagiobothrys lamprocarpus	Shiny-fruited popcorn flower	1-X		
Poa rhizomata	Timber bluegrass	2	Cascade-Siskiyou NM	BLM
Polystichum californicum	California sword-fern	2		
Prosartes parvifolia	Siskiyou fairy bells	1		
Rafinesquia californica	California chicory	2	Cascade-Siskiyou NM, Scotch Creek RNA	BLM
Ranunculus austrooreganus	Southern Oregon buttercup	1	Whetstone Savanna Preserve, Upper Table Rock ACEC	TNC, BLM
Rhamnus ilicifolia	Redberry	2	Cascade-Siskiyou NM	BLM
Ribes divaricatum var. *pubiflorum*	Straggly gooseberry	2	Rogue River WSR	BLM
Romanzoffia thompsonii	Thompson mistmaiden	1		BLM
Salix laevigata	Polished willow	2		
Saxifragopsis fragarioides	Strawberry saxifrage	2	Kalmiopsis WA	FS
Schoenoplectus subterminalis	Water clubrush	2	Kalmiopsis WA	FS
Scirpus pendulus	Drooping bulrush	2	Illinois River State Scenic Waterway, Rogue River Wild & Scenic River	FS, BLM
Sedum moranii	Rogue River stonecrop	1	Rogue River WSR	BLM, FS
Sidalcea hickmanii ssp. *petraea*	Hickman's southern Oregon sidalcea	1		
Sidalcea malachroides	Maple-leaved sidalcea	1-x		
Sidalcea malviflora ssp. *patula*	Coast checker bloom	1		
Silene hookeri ssp. *bolanderi*	Bolander's catchfly	2		BLM
Sisyrinchium hitchcockii	Hitchcock's blue-eyed grass	1	North Bank ACEC	BLM
Solanum parishii	Parish's horse-nettle	2	Cascade-Siskiyou NM, Hinkle Lake SIA	BLM, USDA
Sophora leachiana	Western necklace	1	York Creek SIA, Kalmiopsis WA	FS
Streptanthus glandulosus	Common jewel flower	2		
Streptanthus howellii	Howell's streptanthus	1	Lemmingsworth Gulch RNA, Rough & Ready Flat Preserve SIA/TNC, Kalmiopsis WA	BLM, TNC, FS
Taraxia ovata	Golden eggs	2		
Tauschia howellii	Howell's tauschia	1		FS

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Tetrapteron graciliflorum	Slender-flowered evening-primrose	2	Cascade-Siskiyou NM, Oregon Gulch RNA, Pilot Rock ACEC, Soda Mountain WSA	BLM
Trillium kurabayashii	Giant purple trillium	2	Rogue River WSR, Illinois River WSR	FS
Triteleia ixioides ssp. *anilina*	Sierra brodiaea	2-x		
Triteleia laxa	Ithuriel's spear	2		
Utricularia minor	Lesser bladderwort	2		
Viola primulifolia ssp. *occidentalis*	Western bog violet	1	Lemmingsworth Gulch RNA, Woodcock Bog RNA, Eight Dollar Mountain ACEC	BLM
Wolffia columbiana	Columbia water-meal	2		
Zigadenus fontanus	Small-flowered death camas	2	Ashland RNA	BLM
Nonvascular Plants				
Anastrophyllum minutum	Liverwort	2		
Andreaea schofieldiana	Moss	2	Cascade-Siskiyou NM	BLM
Bryum calobryoides	Moss	2	Oregon Caves NM	NPS
Calypogeia sphagnicola	Liverwort	2	Hunter Creek Bog ACEC, Lemmingsworth Gulch RNA	BLM, FS
Cryptomitrium tenerum	Liverwort	2	Rogue River Wild & Scenic River	
Encalypta brevicollis	Moss	2	Wild Rogue WA	FS
Encalypta brevipes	Moss	2	Wild Rogue WA	FS
Entosthodon fascicularis	Moss	2		
Ephemerum crassinervium	Moss	2		
Meesia uliginosa	Moss	2	Cascade-Siskiyou NM	BLM
Phymatoceros phymatodes	Hornwort	2		
Porella bolanderi	Liverwort	2	Bushnell-Irwin Rocks ACEC/RNA, Cascade-Siskiyou NM, Soda Mt. WA	BLM
Rivulariella gemmipara	Liverwort	1	Sky Lakes WA	FS
Schistidium cinclidodonteum	Moss	2		
Tortula mucronifolia	Moss	2		
Fungi				
Arcangeliella camphorata	Fungus	1		
Dermocybe humboldtensis	Fungus	1	Bushnell-Irwin Rocks RNA	BLM
Gastroboletus vividus	Fungus	1		

KLAMATH MOUNTAINS SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Psathyrella quercicola	Fungus	1-X		
Ramaria spinulosa var. *diminutiva*	Fungus	1		
Rhizopogon chamaleontinus	Fungus	2		
Rhizopogon clavitisporus	Fungus	2		
Rhizopogon ellipsosporus	Fungus	2		
Rhizopogon exiguus	Fungus	2		
Urnula craterium	Fungus	2-x		

Female fisher in her den. Photo by Kerry Rennie © Hoopa Tribal Forestry.

CHAPTER 13. WEST CASCADES ECOREGION

The West Cascades Ecoregion extends from southern British Columbia south almost to the California border. This mountainous, heavily forested ecoregion is bounded on the west by the farms and woodlands of the Willamette Valley or the drier forests and valleys of the Klamath Mountains. To the east, it spills over the crest of the Cascade Mountains to the drier pine forests of the East Cascades.

The crest of the Cascade Range is dominated by a series of volcanic peaks. In Oregon, Mount Hood is the highest at 11,240 feet, but a dozen others top 8,000 feet. The western slopes of the range feature long ridges with steep sides and wide, glaciated valleys. Most of the rivers draining the northern two-thirds of the ecoregion flow into the Willamette Valley and then to the Columbia River system; the southern third drains to the Pacific Ocean through the Umpqua and Rogue River systems. The climate varies with elevation and, to a lesser extent, latitude. Higher elevations receive heavy winter snows. The drier southern half has a fire regime similar to the Klamath Mountains, with frequent lightning-caused fires. In the north, the natural fire regime historically has had less frequent but more severe fires.

The ecoregion is almost entirely forested. Douglas fir-western hemlock forests dominate large areas up to elevations of about 3,300 feet. However, most of the previously-harvested forests of the lowlands and lower slopes now support mixed conifer-deciduous forests, with young Douglas fir and western hemlock forests found in a mosaic with hardwood species such as bigleaf maple and red alder. Silver fir-mountain hemlock forests occur at mid-elevations. Silver fir is common between 2,600 and 4,200 feet. Mountain hemlock is most common between 3,200 and 6,000 feet. In the higher areas, mountain hemlock or occasionally Alaska yellow cedar, subalpine fir or whitebark pine woodlands open into alpine parklands with patches of forest interspersed with shrub and meadow communities. Alpine areas feature a variety of habitats ranging from dwarf shrubs, grasses and forbs to wetlands and barren expanses of rocks and ice.

The West Cascades Ecoregion is almost entirely in federal ownership, managed by the U.S. Forest Service, aside from the lands included in Crater Lake National Park, and some lower elevation lands managed by the Bureau of Land Management. The remaining low elevations areas are a mix of state lands managed by the Oregon Department of Parks and Recreation and the Oregon Department of Forestry, and private lands.

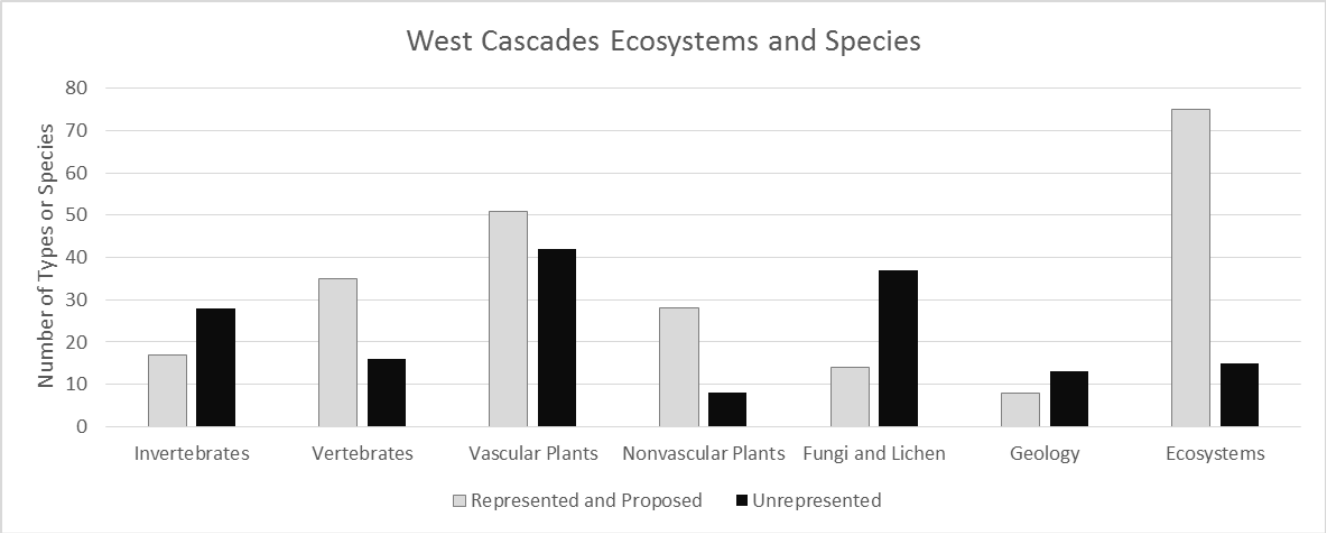


Figure 16. Represented and Unrepresented Ecosystems and Species for the West Cascades Ecoregion.

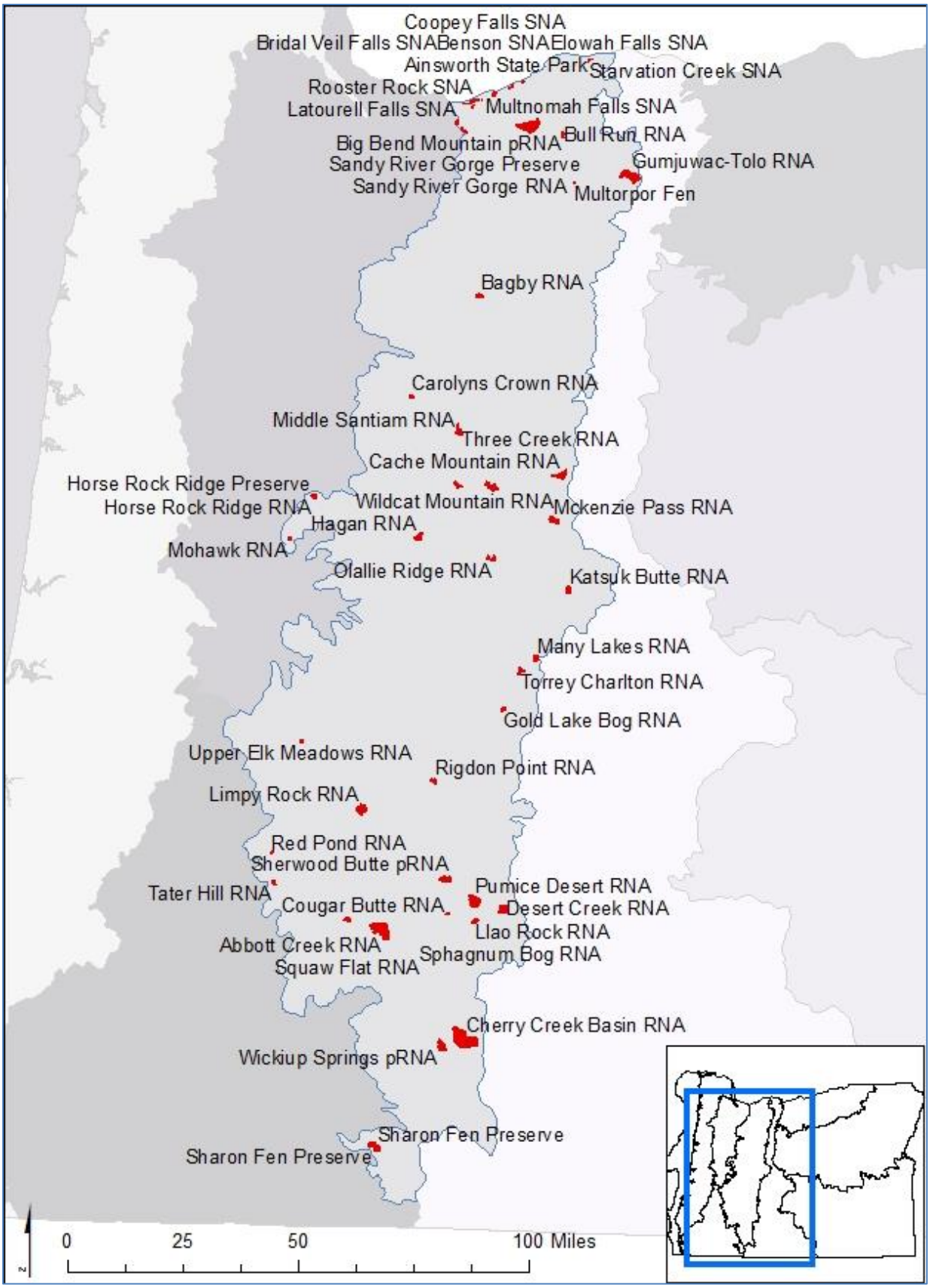


Figure 17. West Cascades Ecoregion Natural Areas Map.

Forest Analysis

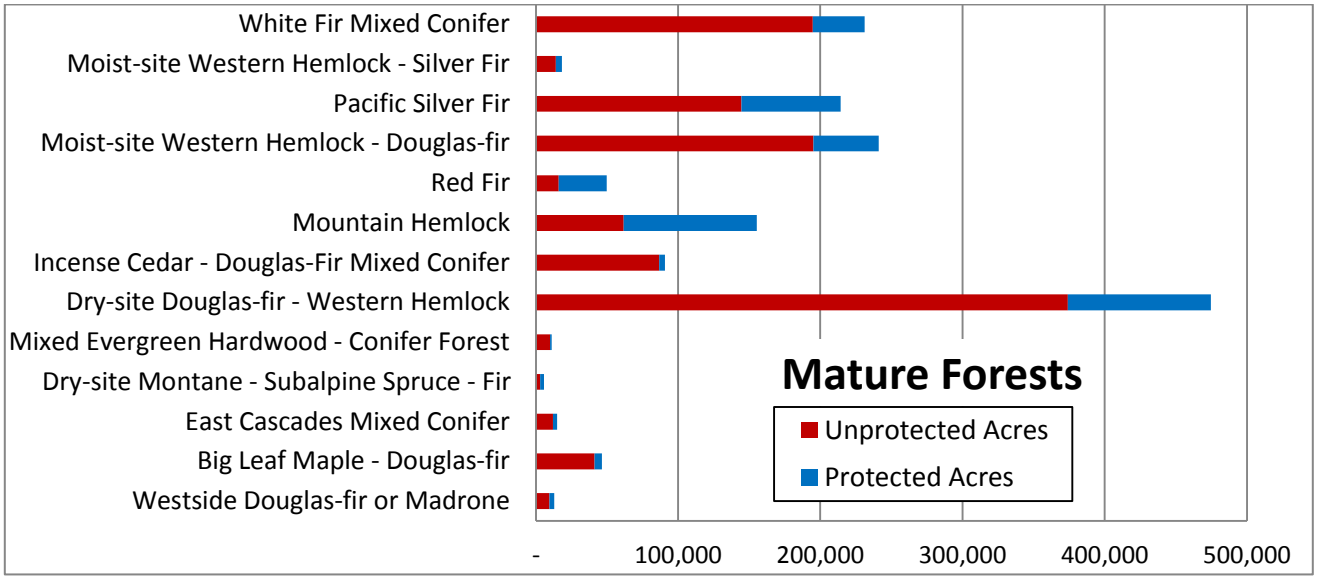


Figure 18. Acreage of mature forest Ecological Systems in the West Cascades Ecoregion.

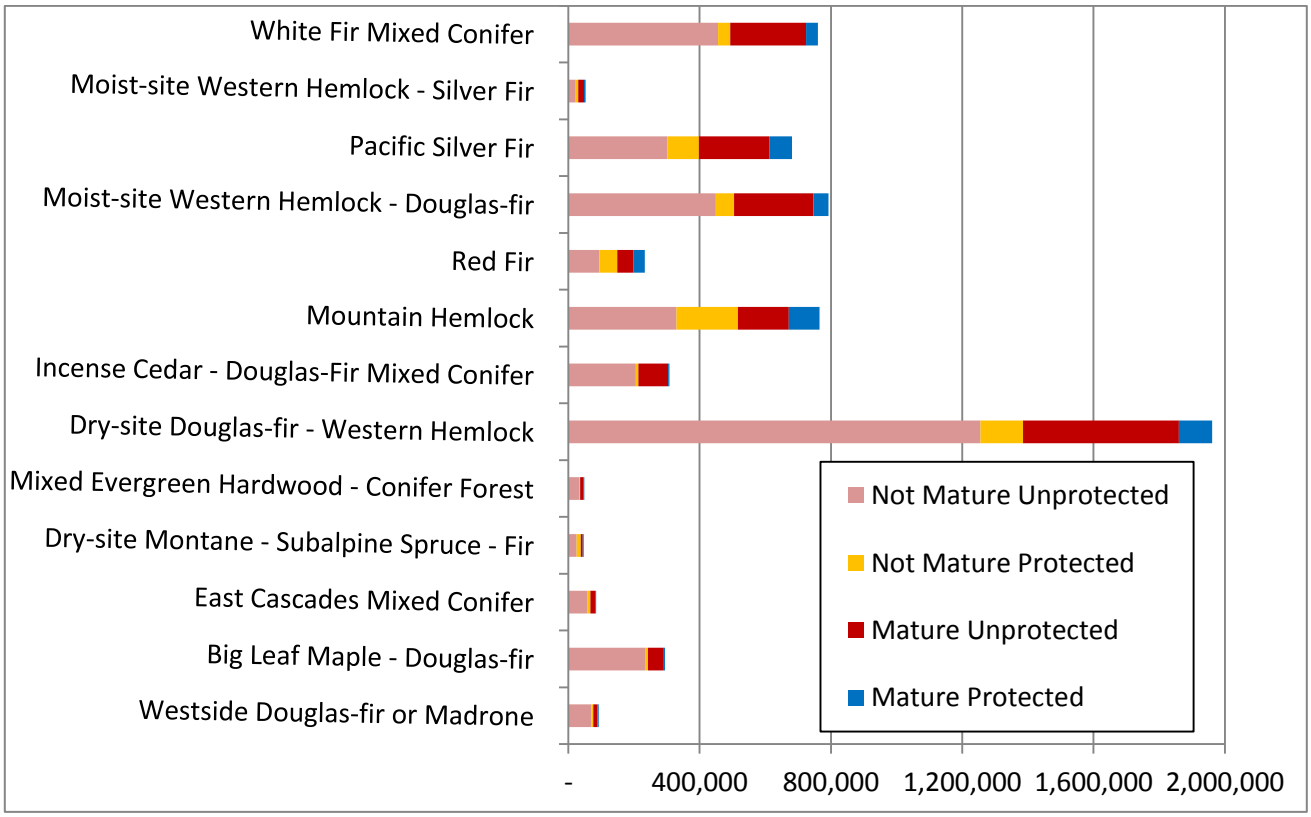


Figure 19. Acreage of total forest types on and off protected areas in the West Cascades Ecoregion.

The 2010 plan listed 92 ecosystem types in the West Cascades, of which 68 were adequately represented on natural areas. Of the 24 types not adequately represented, 15 were forest types, and 9 of these were mixed conifer forests including Douglas fir and/or White fir. Of these, only 21 were non-serpentine conifer forest types.

The good news is that the analysis shows that there are significant acreages of the unrepresented ecosystem types remaining in older forest conditions in the ecoregion. The ecoregion has 17 western hemlock types, all but four of which are represented on natural areas, and these four types are reported to occur at either the Menagerie Wilderness Area or the Columbia Wilderness Area. Identifying sites for natural areas within these wilderness areas should be straightforward. Only two of the 13 silver fir types are not represented (Silver fir/dwarf Oregon grape and Silver fir forest with big huckleberry and dwarf bramble), and they should be relatively easy to find a location for.

In spite of the large number of protected areas in the ecoregion, there are some types not well represented. These are mostly in the southern portions, including 5 of the 6 white fir types listed in the plan, and the two lowest elevation Douglas-fir types. The analysis shows over 90,000 acres of southwestern Oregon Mixed Conifer remainings in old conditions, so there should be sites still available for designation to represent these 7 unfilled cells. Also mapped are 12,841 acres of mature forest in the Westside Douglas-fir - Madrone Ecological System, which may have examples of the low elevation Douglas-fir plant communities. The analysis shows that 46,500 acres mapped as Big Leaf Maple – Douglas-fir Forest in old forest conditions remain in the ecoregion. While 5,254 acres are protected, none are listed in the plan or included in the lists of ecosystems, nor are any Douglas-fir - Pacific madrone types included. An example of each of these types should be included in the plan.

There is an ecosystem type defined as Red-fir-Alaska yellow cedar forest which is a high priority unfilled type, suggested to occur in the Sky Lakes Wilderness. Given the rangewide declines that Alaska cedar is facing (Hennen et al. 2012), designating another natural area aside from Three Creeks RNA to include Alaska cedar seems advisable.

Lastly, there are two lodgepole pine types, one located on glacial outwash, one on recent lahars, which are not represented on any designated natural areas. The extensive lodgepole pine forests around Crater Lake should provide opportunities for designations of at least one of these types.

West Cascades, stream in old forest.

Agency	Priority		Ecosystem Name	Present Representation
			Western Hemlock	
	*	1.	Western hemlock/oceanspray.	Tater Hill RNA Limpy Rock RNA
	*	2.	Western hemlock/salal/twinflower with white-flowered hawkweed and common prince's pine if possible.	Hagan RNA
	*	3.	Western hemlock/salal-Oregon grape.	Hagan RNA
	*	4.	Western hemlock/rhododendron-salal.	Bagby RNA
	*	5.	Western hemlock/rhododendron-Alaska huckleberry.	Middle Santiam RNA
	*	6.	Western hemlock/Alaska huckleberry-salal.	Menagerie WA
	*	7.	Western hemlock/rhododendron/twinflower with beargrass if possible.	Bull Run RNA
	*	8.	Western hemlock/dwarf Oregon grape/swordfern.	Middle Santiam RNA
	*	9.	Western hemlock/dwarf Oregon grape/oxalis.	Middle Santiam RNA
	*	10.	Western hemlock/dwarf Oregon grape/vanilla leaf.	Menagerie WA
	*	11.	Western hemlock/dwarf Oregon grape/twinflower.	Hagan RNA
	*	12.	Western hemlock/salal.	Columbia WA
FS	H	13.	Western hemlock/vanilla leaf.	
	*	14.	Western hemlock/oxalis.	Middle Santiam RNA
	*	15.	Western hemlock/devil's club.	Carolyn’s Crown - Shafer Creek RNA, Columbia WA
	*	16.	River terrace forest with Douglas fir, western red cedar, western hemlock and associated hardwoods.	Middle Santiam R. Terrace ACEC
	*	17.	Old growth western red cedar types.	Carolyn's Crown – Shafer Creek RNA
			Pacific Silver Fir	
FS	L	18.	Silver fir/dwarf Oregon grape.	
	+	19.	Silver fir/rhododendron/beargrass.	Big Bend Mountain WMA Carolyn's Crown – Shafer Creek RNA
	*	20.	Silver fir/rhododendron-dwarf Oregon grape.	Big Bend Mountain WMA Bull Run RNA
FS	M	21.	Silver fir forest with big huckleberry and dwarf bramble.	
	+	22.	Silver fir/big huckleberry/beadlily.	Salmon-Huckleberry WA Big Bend Mountain WMA
	*	23.	Silver fir/big huckleberry/beargrass.	Big Bend Mountain WMA Bull Run RNA
	*	24.	Silver fir/vine maple.	Upper Elk Meadows RNA
	*	25.	Silver fir/Alaska huckleberry/bunchberry with rhododendron if possible.	Big Bend Mountain WMA Wildcat Mountain RNA Carolyn's Crown – Shafer Creek RNA

Agency	Priority		Ecosystem Name	Present Representation
	*	26.	Silver fir/Oregon oxalis.	Carolyn's Crown – Shafer Creek RNA
	*	27.	Silver fir/coolwort foamflower and silver fir/vine maple/coolwort foamflower communities.	Wildcat Mountain RNA
	*	28.	Silver fir/Cascades azalea with fool's huckleberry.	Mount Hood WA
	*	29.	Silver fir/Devil's club.	Big Bend Mountain WMA Bull Run RNA
	+	30.	Douglas fir-canyon live oak forest.	Bear Gulch RNA
			Douglas Fir	
	*	31.	Douglas fir-Oregon white oak/poison oak woodland with associated meadows.	Squaw Flat RNA
FS, BLM	M	32.	Douglas fir/poison oak woodland.	
	*	33.	Douglas fir/salal/swordfern forest.	Red Ponds RNA
	*	34.	Douglas fir/oceanspray-dwarf Oregon grape.	Rigdon Point RNA
	*	35.	Douglas fir/oceanspray/whipplevine with incense cedar if possible.	Limpy Rock RNA
FS	H	36.	Douglas fir-ponderosa pine-incense cedar/California fescue forest.	
	*	37.	Douglas fir-ponderosa pine-sugar pine/evergreen shrub forest.	Abbott Creek RNA
			White Fir and Red Fir	
FS, BLM	M	38.	White fir-Douglas fir/Piper's Oregon grape.	
	*	39.	White fir-incense cedar/dwarf Oregon grape forest.	Abbott Creek RNA
FS	M	40.	White fir-Douglas fir forest with dwarf Oregon grape and threeleaf anemone and tall shrubs if possible.	
FS, BLM	M	41.	White fir/big huckleberry or vine maple with twinflower, vanilla leaf or snow bramble.	
FS, BLM	M	42.	White fir/dwarf Oregon grape-salal.	
	L	43.	White fir-red fir/prince's pine.	
	*	44.	Ponderosa pine/greenleaf manzanita-bitterbrush.	Desert Creek RNA
	*	45.	Shasta red fir/big huckleberry.	Wickiup Springs pRNA Cougar Butte RNA
	*	46.	Red fir-Alaska yellow cedar forest.	Sky Lakes WA
	*	47.	Mountain meadow-white fir forest mosaic with blue wildrye and Umpqua swertia.	Cougar Butte RNA
			Mountain Hemlock	
	8	48.	Mountain hemlock/big huckleberry.	Gold Lake Bog RNA, Waldo WA
	*	49.	Mountain hemlock/rhododendron.	Three Sisters WA, Waldo Lake WA

Agency	Priority		Ecosystem Name	Present Representation
	+	50.	Mountain hemlock/grouse huckleberry and mountain hemlock/woodrush forests.	Torrey-Charlton RNA Three Sisters WA
			Subalpine and Alpine Communities	
	*	51.	Subalpine bitterbrush steppe with long stolon sedge and needlegrass.	Desert Creek RNA
	*	52.	Engelmann spruce-subalpine fir forest.	Gold Lake Bog RNA
	*	53.	Alaska yellow cedar forest mosaic.	Three Creeks RNA
	*	54.	Lodgepole pine/Brewer's sedge forest.	Pumice Desert RNA
	*	55.	Whitebark pine in the high Cascades.	Llao Rock RNA
	*	56.	Subalpine meadow mosaic in the high Cascades.	Three Sisters WA, Mt. Jefferson WA Rogue-Umpqua Divide WA
	*	57.	Subalpine pumice and ash fields.	Pumice Desert RNA
	*	58.	Alpine needlegrass in the high Cascades.	Sky Lakes WA, Mountain Lakes WA
	*	59.	Alpine mosaic (above treeline with a variety of meadows, rocky areas, and aspects).	Three Sisters WA, Mount Jefferson WA Mount Thielsen WA
			Special Types	
	*	60.	Lava flow with representative vegetation (range from mid to high elevations).	McKenzie Pass RNA
FS	U	61.	Recent lahar (mudflow) with successional forest communities including lodgepole pine/pinemat manzanita.	
FS	L	62.	Lodgepole pine/sedge communities on glacial outwash.	
	+	63.	Blue wildrye or red fescue grass bald communities.	Horse Rock Ridge RNA Grassy Mountain pACEC
	+	64.	Chaparral communities dominated by chinquapin and manzanita.	Old Baldy RNA
			Lacustrine	
	*	65.	Mid-montane lake with aquatic beds and marshy shore, surrounded by mixed conifer forest.	Lost Lake RNA
		66.	Mid to upper montane lake with aquatic beds and marshy shore.	Waldo Lake WA,. Diamond Lake WA, Mt Jefferson WA, Mt. Washington WA
	+	67.	Subalpine lake.	Big Bend Mountain RNA, Crabtree Lake ONA/ACEC
	*	68	Alpine lake.	Three Sisters WA
	*	69.	Ultraoligotrophic montane lake.	Waldo Lake WA, Crater Lake National Park
			Palustrine	
	*	70.	Low elevation pond, with aquatic beds and marshy shore.	Red Ponds RNA

Agency	Priority		Ecosystem Name	Present Representation
	*	71.	Upper montane to subalpine pond, with aquatic beds and marshy shore.	Gold Lake Bog RNA, Torrey-Charlton RNA, Many Lakes RNA
	*	72.	Alpine pond.	Three Sisters WA
	+	73.	Montane vernal pond.	Big Bend Mountain pRNA Torrey-Charlton RNA
FS	U	74.	Flowing and pooled hot springs.	
	*	75.	Flowing and pooled cold springs.	Big Bend Mountain pRNA, Bull Run RNA, Three Sisters WA
	*	76.	Vernal seepage slopes on low to mid elevation rocky bald communities, with monkeyflower, saxifrage and moss.	Horse Rock Ridge RNA Grassy Mountain pACEC
	+	77.	Sphagnum mire on floating lake fill mat.	Hidden Lake SIA
	+	78.	Sitka sedge fen.	Big Bend Mountain pRNA
	*	79.	Subalpine sedge fen, dominated by black and Holm sedge.	Three Sisters WA Mount Jefferson WA
	*	80.	Few flowered spikerush/brown moss fen, with lodgepole pine.	Gold Lake Bog RNA Many Lakes RNA
	*	81.	Bog laurel shrub swamp.	Torrey-Charlton RNA Sphagnum Bog RNA
	*	82.	Forb flush on seepage slope (including marsh marigold, shooting-star, bistort, arrowleaf groundsel and false hellebore).	Upper Elk Meadows RNA Three Sisters WA Mt. Jefferson WA
	*	83.	Geyer willow shrub swamp.	Gold Lake Bog RNA
	*	84.	Sitka alder/devils club swamp on seepy talus slopes or avalanche tracks.	Three Sisters WA Mt. Jefferson WA
	*	85.	Sitka alder/lady fern swamp.	Upper Elk Meadows RNA Olallie Ridge RNA
	*	86.	Bog birch shrub swamp.	Gold Lake Bog RNA Many Lakes RNA
	+	87.	Mountain alder/sedge on organic soils.	Sphagnum Bog RNA Many Lakes RNA
	*	88.	Bog blueberry shrubswamp, with Engelmann spruce, lodgepole pine, and tufted hairgrass.	Gold Lake Bog RNA Many Lakes RNA
FS, BLM	H	89.	Western red cedar-western hemlock/skunk cabbage swamp.	
FS	L	90.	Alaska yellow cedar/devils club swamp.	

WEST CASCADES GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Holocene	
	*	1.	Columbia River Gorge	Columbia River Gorge National Scenic Area
	*	2.	Multnomah Falls	Columbia River Gorge National Scenic Area
PRD	H	3.	Sand dunes in western Columbia River Gorge	*Rooster Rock State Park*
	*	4.	Bridge of the Gods Landslide	Columbia River Gorge National Scenic Area
	*	5.	Bagby Hot Springs	Bagby RNA
			Pleistocene and Holocene	
	*	6.	Eliot Glacier	Mt. Hood WA
FS	M	7.	Old Maid Lahar	*Sandy River*
	M	8.	Cascades Stratovolcanoes Cone: Mt. McLoughlin	*Mt. McLoughlin*
	*	9.	Cascades Stratovolcanoes Eroded cone: Three-Fingered Jack	Mt. Washington WA
	*	10.	Cascades Stratovolcanoes Caldera: Crater Lake	Crater Lake National Park
			Pliocene and Miocene	
FS	L	11.	Outerson volcanics	*Outerson Mountain*
FS	L	12.	Rhododendron Formation	*Rhododendron*
			Miocene and Oligocene	
	*	13.	Eagle Creek Formation	Eagle Creek, Columbia River Gorge National Scenic Area
FS	L	14.	Sardine Formation	*Sardine Mountain*
FS, PVT	L	15.	Breitenbush Formation	*Cleator Bend, Breitenbush River*
			Oligocene and Eocene	
FS	L	16.	Heppsie Andesite	*Heppsie Mountain*
FS	L	17.	Wasson Formation	*Lake Creek*
FS	L	18.	Roxy Formation	*Ashland*
FS	L	19.	Tuff of Bond Creek	*Diamond Rock*
FS	L	20.	Colestin Formation	*Colostin*
			Cretaceous	
FS	L	21.	Hornbrook Formation	*Jacksonville*

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Invertebrates				
Agonum belleri	Beller's ground beetle	2		
Allomyia scotti	Scott's apatanian caddisfly	1	White River WSR, Salmon River WSR	BLM, FS
Anodonta californiensis	California floater (mussel)	2		
Anodonta nuttalliana	Winged floater	2		
Bombus occidentalis	Western bumblebee	2	Mount Hood WA, Cascade-Siskiyou NM	FS, BLM
Callophrys johnsoni	Johnson's hairstreak (butterfly)	1	Cascade-Siskiyou NM, Mohawk RNA	BLM
Chloealtis aspasma	Siskiyou short-horned grasshopper	1	Cascade-Siskiyou NM	BLM
Colligyrus sp. 4	Columbia duskysnail	1	Mount Hood WA, White River WSR	FS, BLM
Cryptomastix devia	Puget oregonian (snail)	1		
Cryptomastix hendersoni	Columbia Gorge oregonian (snail)	1		
Farula constricta	A caddisfly	1	Multnomah Falls SNA, Hatfield WA	FS
Fluminicola sp. 15	Tiger lily pebblesnail	1		
Fluminicola sp. 19	Keene Creek pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 21	Pinhead pebblesnail	1		
Fluminicola sp. 4	Fall Creek pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 7	Lake of the Woods pebblesnail	1		
Gonidea angulata	Western ridged mussel	2		
Helminthoglypta hertleini	Oregon shoulderband (snail)	1		
Hesperia colorado oregonia	Oregon branded skipper (butterfly)	2	Cascade-Siskiyou NM	BLM
Juga hemphilli dallesensis	Dalles juga (snail)	1		
Juga hemphilli hemphilli	Barren juga (snail)	1		
Juga sp. 1	Basalt juga (snail)	1		
Juga sp. 3	Brown juga (snail)	1		
Juga sp. 6	Purple juga (snail)	1	North Umpqua River WSR	FS
Juga sp. 7	Three-band juga (snail)	1		
Lanx subrotunda	Rotund lanx (snail)	1	North Umpqua River WSR	FS
Monadenia fidelis celeuthia	Traveling sideband (snail)	1		
Monadenia fidelis columbiana	Columbia sideband (snail)	2		
Monadenia fidelis minor	Oregon snail (Dalles sideband)	1	Hood River, East Fork WSR	FS
Monadenia fidelis ssp. 3	Duncan sideband (snail)	1		

Scientific Name	Common Name	List	Present Representation	Agency
Neothremma andersoni	Columbia Gorge caddisfly	1	Multnomah Falls SNA	FS
Physella columbiana	Rotund physa (snail)	1		
Physella hordacea	Grain physa (snail)	1		
Plebejus podarce klamathensis	Gray blue (butterfly)	2		
Polites mardon	Mardon skipper (butterfly)	1	Cascade-Siskiyou NM	BLM
Pristiloma crateris	Crater Lake tightcoil (snail)	1	Crater Lake National Park, Sandy River WSR	NPS, FS
Pristiloma wascoense	Shiny tightcoil (snail)	2		
Prophysaon sp. 1	Klamath tail-dropper (slug)	1		
Rhyacophila chandleri	A caddisfly	2		
Rhyacophila leechi	A caddisfly	2	H.J. Andrews Experimental Forest	FS
Speyeria coronis coronis	Coronis fritillary (butterfly)	2		
Vanduzeeina borealis californica	California shield-backed bug	2		
Vespericola sierranus	Siskiyou hesperian (snail)	1	Cascade-Siskiyou NM	BLM
Vorticifex neritoides	Nerite ramshorn (snail)	1		
Zapada wahkeena	Wahkeena Falls flightless stonefly	1	Columbia River Gorge NSA, Multnomah Falls SNA	FS
Fish				
Catostomus rimiculus pop. 1	Jenny Creek sucker	1		
Entosphenus tridentatus	Pacific lamprey	2		
Oncorhynchus clarkii pop. 2	Coastal cutthroat trout (Southwestern Washington/ Columbia River ESU)	1	Mount Hood WA, Hatfield WA	FS
Oncorhynchus keta pop. 3	Chum salmon (Columbia River ESU)	1		
Oncorhynchus kisutch pop. 1	Coho salmon (Lower Columbia River ESU)	1	Salmon-Huckleberry WA, Salmon River WSR, Roaring River WSR, Clackamas River WSR	FS
Oncorhynchus kisutch pop. 3	Coho salmon (Oregon Coast ESU)	1	North Umpqua River WSR	BLM
Oncorhynchus mykiss pop. 24	Steelhead (Klamath Mountains Province ESU, summer run)	2		
Oncorhynchus mykiss pop. 25	Steelhead (Klamath Mountains Province ESU, winter run)	2		
Oncorhynchus mykiss pop. 26	Steelhead (Lower Columbia River ESU, summer run)	1	Hood River, East Fork WSR	FS
Oncorhynchus mykiss pop. 27	Steelhead (Lower Columbia River ESU, winter run)	1	Columbia River Gorge National Scenic Area, Mount Hood WA, Hatfield WA	FS

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Oncorhynchus mykiss pop. 30	Steelhead (Oregon Coast ESU, summer run)	1	North Umpqua River WSR	FS
Oncorhynchus mykiss pop. 31	Steelhead (Oregon Coast ESU, winter run)	1	North Umpqua River WSR	FS
Oncorhynchus mykiss pop. 33	Steelhead (Upper Willamette River ESU, winter run)	1	Elkhorn Creek River WSR	BLM
Oncorhynchus tshawytscha pop. 21	Chinook salmon (Lower Columbia ESU, spring run)	1	Salmon-Huckelberry WA	FS
Oncorhynchus tshawytscha pop. 22	Chinook salmon (Lower Columbia ESU, fall run)	1	Buck and Gordon Creeks NA, Sandy River WSR	Metro, BLM
Oncorhynchus tshawytscha pop. 23	Chinook salmon (Upper Willamette ESU, spring run)	1	Bull of the Woods WA, Clackamas River WSR	FS
Oregonichthys crameri	Oregon chub	1		
Oregonichthys kalawatseti	Umpqua chub	1		
Salvelinus confluentus pop. 14	Bull trout (Odell Lake SMU)	1	Diamond Peak WA	FS
Salvelinus confluentus pop. 18	Bull trout (Deschutes SMU)	1		
Salvelinus confluentus pop. 17	Bull trout (Willamette SMU)	1	McKenzie River WSR	FS
Salvelinus confluentus pop. 21	Bull trout (Hood River SMU)	1	Mount Hood WA, Hood River River WSR	FS
Amphibians				
Dicamptodon copei	Cope's giant salamander	2	Columbia Gorge NSA, Hatfield WA, Bull Run RNA, White River WSR	FS, BLM
Plethodon larselli	Larch Mountain salamander	2	Columbia Gorge NSA, Seneca Fouts Memorial NA, Starvation Creek State Park	FS, PRD
Rana boylii	Foothill yellow-legged frog	2	North Umpqua Wild & Scenic River, Cascade-Siskiyou NM	FS, BLM
Rana pretiosa	Oregon spotted frog	1	Gold Lake Bog RNA, Many Lakes RNA, Sky Lakes WA, Three Sisters WA, Cascade-Siskiyous NM	BLM, FS
Taricha granulosa mazamae	Crater Lake newt	1	Crater Lake National Park	NPS
Reptiles				
Actinemys marmorata	Western pond turtle	2	North Fork of the Middle Fork Willamette WSR, Rogue Umpqua Divide WA, Cascade-Siskiyou NM	FS, BLM
Chrysemys picta	Painted turtle	2		
Birds				
Bucephala albeola	Bufflehead	2		
Coccyzus americanus	Yellow-billed cuckoo	2-x		

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Cypseloides niger	Black swift	2	Starvation Creek State Park, Three Sisters WA	PRD, FS
Egretta thula	Snowy egret	2	Upper Klamath NWR	FWS
Falco peregrinus anatum	American peregrine falcon	2	Columbia Gorge NSA, Crater Lake NP, Starvation Creek SP, Three Sisters WA	FS, PRD, NPS
Gymnogyps californianus	California condor	1-x		
Histrionicus histrionicus	Harlequin duck	2	Boulder Creek WA, Three Sisters WA, McKenzie River WSR, Salmon-Huckleberry WA, Hood River WSR	FS
Melanerpes lewis	Lewis's woodpecker	2		
Picoides albolarvatus	White-headed woodpecker	2	Cache Mountain RNA	FS
Podiceps auritus	Horned grebe	2		
Podiceps grisegena	Red-necked grebe	2	Upper Klamath NWR	FWS
Progne subis	Purple martin	2	Columbia Gorge NSA	
Strix occidentalis caurina	Northern spotted owl	1	Limpy Rock RNA, Rigdon Point RNA, Wildcat Mountain RNA, Crater Lake NP, H.J. Andrews Experimental Forest, Sky Lakes WA	BLM, NPS, FS
Mammals				
Antrozous pallidus	Pallid bat	2	Upper Rogue River WSR	FS
Canis lupus	Gray wolf	2	Cascade-Siskiyou NM, Sky Lakes WA,	FS, BLM
Corynorhinus townsendii	Townsend's big-eared bat	2	Clackamas River State Scenic Waterway, Mt Washington WA, North Umpqua WSR, Silver Falls SP	PRD, FS
Gulo gulo	Wolverine	2	Mt. Jefferson WA, Mt. Thielson WA, Mt. Washington WA	
Lynx canadensis	Canada lynx	2		
Myotis thysanodes	Fringed myotis	2	H.J. Andrews Experimental Forest, Roaring River WA	FS
Pekania pennanti	Fisher	2	Upper Rogue River WSR, Rogue-Umpqua Divide, Diamond Peak WA,	FS
Ursus arctos horribilis	Grizzly bear	2-x		
Vulpes vulpes necator	Sierra Nevada red fox	1	Sky Lakes WA	FS
Vascular Plants				
Agoseris elata	Tall agoseris	2	Mt Hood WA	FS
Agrostis howellii	Howell's bentgrass	1	Wahkeena Falls, Elowah Falls	FS
Allium peninsulare	Peninsular onion	2		
Anemone oregana var. *felix*	Bog anemone	2		

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Arnica viscosa	Shasta arnica	2	Crater Lake National Park, Mt Thielsen WA, Three Sisters WA	NPS, FS
Artemisia campestris var. *wormskioldii*	Northern wormwood	1-x		
Asplenium septentrionale	Grass-fern	2		
Boechera atrorubens	Sickle-pod rockcress	2	Columbia Gorge NSA	FS
Boechera hastatula	Hells Canyon rockcress	1	Wildcat Mountain RNA	BLM
Bochera. horizontalis	Crater Lake rockcress	1	Sky Lakes WA, Crater Lake National Park	FS, NPS
Botrychium montanum	Mountain grape-fern	2	White River WSR	FS
Botrychium pumicola	Pumice grape-fern	1	Crater Lake National Park, Three Sisters WA,	NPS, FS
Calamagrostis breweri	Brewer reedgrass	2	Mt Hood WA, Mt Jefferson WA	FS
Calochortus monophyllus	One-leaved calochortus	2		
Calochortus nitidus	Broad-fruit mariposa lily	2		
Calochortus umpquaensis	Umpqua mariposa-lily	1	Ace Williams Mountain ACEC	BLM
Carex capitata	Capitate sedge	2	Cascade-Siskiyou NM	BLM
Carex crawfordii	Crawford's sedge	2	Crater Lake National Park	NPS
Carex diandra	Lesser panicled sedge	2	Three Sisters WA	FS
Carex lasiocarpa var. *americana*	Slender sedge	2		
Carex livida	Pale sedge	2	Big Bend pRNA, Three Sisters WA	FS
Carex macrochaeta	Alaska long-awned sedge	2	Columbia Gorge NSA	FS
Carex nardina	Spikenard sedge	2	Mt. Thielsen WA	FS
Carex retrorsa	Retrorse sedge	2		
Carex scirpoidea ssp. *stenochlaena*	Alaskan single-spiked sedge	2		
Carex vernacula	Native sedge	2		
Castilleja chlorotica	Green-tinged paintbrush	2		
Castilleja collegiorum		1	Sky Lakes WA	FS
Castilleja thompsonii	Thompson's paintbrush	2		
Cheilanthes covillei	Coville's lipfern	2		
Cicendia quadrangularis	Timwort	2		
Collomia mazama	Mt. Mazama collomia	1	Sphagnum Bog RNA, Sky Lakes WA	NPS, FS
Coptis trifolia	Three-leaf goldthread	2	*Crater Creek*	
Corydalis aquae-gelidae	Cold-water corydalis	1	Clackamas River State Scenic Waterway	FS

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Cryptantha simulans	Pine woods cryptantha	2		
Cypripedium fasciculatum	Clustered lady's-slipper	2	Cascade-Siskiyou NM, Umpqua River State Scenic Waterway	BLM
Delphinium nuttallii	Nuttall's larkspur	2	Abbott Creek RNA	FS
Delphinium oreganum	Willamette Valley larkspur	1		
Delphinium pavonaceum	Peacock larkspur	1		
Erigeron howellii	Howell's daisy	1	Columbia Gorge NSA, Mark O. Hatfield WA	FS
Erigeron oreganus	Oregon daisy	1	Oneonta Gorge SIA	FS
Eriogonum villosissimum	Acker Rock wild buckwheat	1	*Acker Rock*	FS
Eucephalus gormanii	Gorman's aster	1	Bull-of-the-Woods WA, Mt. Jefferson WA, Table Rock WA	FS
Eucephalus vialis	Wayside aster	1		
Frasera umpquaensis	Umpqua swertia	1	Rogue-Umpqua WA, Upper Elk Meadows ACEC/RNA	FS, BLM
Fritillaria camschatcensis	Indian rice	2	*Latourell Prairie, Bull Run Watershed*	FS
Fritillaria gentneri	Gentner's fritillaria	1	*Gray Creek, Dog Creek*	
Gentiana newberryi var. *newberryi*	Newberry's gentian	2	Mt Washington WA, Sky Lakes WA, Three Sisters WA	FS
Hackelia bella	Beautiful stickseed	2	Cascade-Siskiyou NM	BLM
Hesperocyparis bakeri	Baker's cypress	2	Oliver Mathews RNA, Miller Lake SIA	BLM
Hieracium horridum	Shaggy hawkweed	2	Crater Lake National Park	NPS
Horkelia congesta ssp. *congesta*	Shaggy horkelia	1		
Iliamna latibracteata	California globe-mallow	1		
Kalmiopsis fragrans	North Umpqua kalmiopsis	1	Limpy Rock RNA	BLM
Lathyrus holochlorus	Thin-leaved peavine	1		
Lewisia columbiana var. *columbiana*	Columbia lewisia	2	Columbia Gorge NSA	FS
Limnanthes alba ssp. *gracilis*	Slender meadow-foam	1		
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadow-foam	1	Poverty Flat Preserve, *Pinehurst*	TNC
Lobelia dortmanna	Water lobelia	2		
Lupinus oreganus	Kincaid's lupine	1		
Lycopodiella inundata	Northern bog clubmoss	2	Williams Lake ACEC, Diamond Peak WA, *Multorpor Fen*, Three Sisters WA	BLM, FS
Lycopodium complanatum	Ground cedar	2	Mt Hood WA	FS

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Meconella oregana	White meconella	1		
Nemacladus capillaris	Slender nemacladus	2	Cascade-Siskiyou NM, *Pinehurst*	BLM
Ophioglossum pusillum	Adder's-tongue	2		
Penstemon barrettiae	Barrett's penstemon	1	Bonneville Dam	ACE
Penstemon peckii	Peck's penstemon	1		
Perideridia erythrorhiza	Red-root yampah	1	Cascade-Siskiyou NM	BLM
Phlox hendersonii	Henderson phlox	2	Mt Hood WA	FS
Plagiobothrys figuratus ssp. *corallicarpus*	Coral seeded allocarya	1	Cascade-Siskiyou NM	BLM
Plagiobothrys greenei	Greene's popcorn flower	2		
Poa rhizomata	Timber bluegrass	2		
Polystichum californicum	California sword-fern	2	North Umpqua WSR	FS
Potentilla villosa	Villous cinquefoil	2	Mt Hood WA	FS
Ranunculus austrooreganus	Southern Oregon buttercup	1		
Rhynchospora alba	White beakrush	2		
Ribes divaricatum var. *pubiflorum*	Straggly gooseberry	2		
Romanzoffia thompsonii	Thompson mistmaiden	1	Iron Mountain SIA, Rogue-Umpqua WA	FS
Rorippa columbiae	Columbia cress	1	Columbia Gorge NSA	FS
Rotala ramosior	Toothcup	2		
Scheuchzeria palustris ssp. *americana*	Scheuchzeria	2	Diamond Peak WA, Gold Lake Bog RNA, Many Lakes RNA, Three Sisters WA	
Schoenoplectus subterminalis	Water clubrush	2		
Scirpus pendulus	Drooping bulrush	2	Horse Rock Ridge RNA	
Sisyrinchium sarmentosum	Pale blue-eyed grass	1	*Little Crater Lake (Mt. Hood)*	FS
Solanum parishii	Parish's horse-nettle	2		
Streptopus streptopoides	Kruhsea	2	Big Bend pRNA	
Suksdorfia violacea	Violet suksdorfia	2	Columbia Gorge NSA,Seneca Fouts Memorial NA, Viento State Park	FS, PRD
Sullivantia oregana	Oregon sullivantia	1	Table Rock WA	FS
Tauschia stricklandii	Strickland's tauschia	2	*Moffett Creek – Bull Run Watershed*	
Utricularia gibba	Humped bladderwort	2	Foster Dam	ACE

Scientific Name	Common Name	List	Present Representation	Agency
Utricularia minor	Lesser bladderwort	2	Crater Lake National Park, Diamond Peak WA, Gold Lake Bog RNA, Many Lakes RNA Sharon Fen Preserve, Sphagnum Bog RNA, Three Sisters WA	BLM, NPS, FWS, FS
Utricularia ochroleuca	Northern bladderwort	2	Gold Lake Bog RNA, Waldo Lake WA	
Wolffia borealis	Dotted water-meal	2	Red Ponds RNA, Foster Dam	BLM, ACE
Wolffia columbiana	Columbia water-meal	2	Red Ponds RNA	BLM
Nonvascular Plants				
Anastrophyllum minutum	Liverwort	2	Mt Hood WA, Mt. Jefferson WA, Three Sisters WA	FS
Andreaea schofieldiana	Moss	2	Carolyn's Crown-Shafer Creek RNA	BLM
Anthelia julacea	Liverwort	2	Mt. Hood WA	FS
Barbilophozia lycopodioides	Liverwort	2	Mt Jefferson WA	FS
Blepharostoma arachnoideum	Liverwort	2		
Brachydontium olympicum	Moss	2		
Bryum calobryoides	Moss	2	Olallie Ridge RNA	
Calypogeia sphagnicola	Liverwort	2	Gold Lake Bog RNA, Salmon-Huckleberry WA, White Rock Fen ACEC	BLM
Cephaloziella spinigera	Liverwort	2	Crater Lake NP	NPS
Conostomum tetragonum	Moss	2	Mt Hood WA	FS
Entosthodon fascicularis	Moss	2	Horse Rock Ridge ACEC	BLM
Gymnomitrion concinnatum	Liverwort	2	Columbia Gorge NSA , Mt Hood WA	FS
Haplomitrium hookeri	Liverwort	2	Three Sisters WA	FS
Harpanthus flotovianus	Liverwort	2	Three Sisters WA	FS
Herbertus aduncus ssp. *aduncus*	Liverwort	2	Columbia Gorge NSA , Guy W. Talbot State Park, Latourell Falls State Park, Oneonta Gorge SIA	FS, PRD
Jamesoniella autumnalis var. *heterostipa*	Liverwort	1	Waldo Lake WA	FS
Jungermannia polaris	Liverwort	2	Three Sisters WA, Waldo Lake WA	FS
Marsupella condensata	Liverwort	2	Mt Hood WA	FS
Marsupella emarginata var. *aquatica*	Liverwort	2	North Fork Of The Middle Fork Willamette River State Scenic Waterway, Waldo WA	FS
Marsupella sparsifolia	Liverwort	2		
Nardia japonica	Liverwort	2	Mt Hood WA, Three Sisters WA	FS

Scientific Name	Common Name	List	Present Representation	Agency
Polytrichastrum sexangulare var. *vulcanicum*	Moss	2	Mt Hood WA	FS
Porella bolanderi	Liverwort	2		
Porella vernicosa ssp. *fauriei*	Liverwort	2-x	Columbia Gorge NSA	FS
Preissia quadrata	Liverwort	2	Mt Jefferson WA	FS
Pseudocalliergon trifarium	Moss	2		
Racomitrium depressum	Moss	2		
Rivulariella gemmipara	Liverwort	1	Three Sisters WA, Mt Jefferson WA, Sky Lakes WA, Waldo Lake WA	FS
Scapania gymnostomophila	Liverwort	2	Elowah Falls State Natural Area	PRD
Scapania obscura	Liverwort	2	Three Sisters WA	FS
Schistochilopsis laxa	Liverwort	2		
Schofieldia monticola	Liverwort	2	Three Sisters WA	FS
Tayloria serrata	Moss	2		
Tetraphis geniculata	Moss	2	Salmon-Huckleberry WA, Mark O. Hatfield WA	FS
Trematodon asanoi	Moss	2	Three Sisters WA	FS
Fungi				
Alpova alexsmithii	Fungus	1	Mt Jefferson WA	FS
Bryoglossum gracile	Fungus	2		
Chamonixia caespitosa	Fungus	2	Sky Lakes WA	FS
Choiromyces venosus	Fungus	2	Mohawk ACEC/RNA	BLM
Cortinarius barlowensis	Fungus	2		
Cystangium idahoensis	Fungus	1		
Destuntzia rubra	Fungus	2-ex		
Gastroboletus imbellus	Fungus	1-X		
Gastroboletus vividus	Fungus	1	Crater Lake NP	NPS
Gymnomyces fragrans	Fungus	1		
Gymnomyces nondistincta	Fungus	1		
Helvella crassitunicata	Fungus	2	Mt Hood WA, Mt Washington WA, Mt Jefferson WA	FS
Hypotrachyna revoluta	Lichen	2		
Hypotrachyna riparia	Lichen	1	*Cascadia State Park, Camas Prairie*	PRD, FS
Leptonia rosea var. *marginata*	Fungus	2-x		
Leptonia subeuchroa	Fungus	2-x		

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Lobaria linita	Lichen	2	Middle Santiam WA	FS
Lyophyllum acutipes	Fungus	1-X		
Lyophyllum chamaeleon	Fungus	1-X		
Lyophyllum conoideospermum	Fungus	1-X		
Lyophyllum furfurellum	Fungus	2-ex		
Lyophyllum gracile	Fungus	2-x		
Lyophyllum lubricum	Fungus	1-X		
Lyophyllum pallidum	Fungus	1		
Lyophyllum solidipes	Fungus	1-X		
Macowanites mollis	Fungus	1		
Microcalicium arenarium	Lichen	2	Guy W. Talbot State Park	PRD
Mythicomyces corneipes	Fungus	2		
Octaviania macrospora	Fungus	1-X		
Pannaria rubiginella	Lichen	2		
Pannaria rubiginosa	Lichen	2	Grassy Mountain ACEC	BLM
Phaeocollybia oregonensis	Fungus	1	Salmon-Huckleberry WA, Columbia Gorge NSA	FS
Pilophorus nigricaulis	Lichen	2	Carolyn's Crown-Shafer Creek RNA	BLM
Psathyrella gruberi	Fungus	1-X		
Psathyrella oregonensis	Fungus	1-X		
Psathyrella subcaespitosa	Fungus	1-X		
Psathyrella wapinitaensis	Fungus	2-x		
Pseudocyphellaria mallota	Lichen	2	Middle Santiam WA	FS
Pseudorhizina californica	Fungus	2	Cherry Creek Basin, Sky Lakes WA	FS
Ramalina pollinaria	Lichen	2		
Rhizopogon brunneifibrillosus	Fungus	2-x		
Rhizopogon clavitisporus	Fungus	2		
Rhizopogon ellipsosporus	Fungus	2		
Rhizopogon inquinatus	Fungus	2		
Rhizopogon masoniae	Fungus	1-X		
Rhizopogon quercicola	Fungus	2-x		
Squamanita paradoxa	Fungus	2-x		
Stagnicola perplexa	Fungus	2		

WEST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Stereocaulon spathuliferum	Lichen	2	Carolyn's Crown – Shafer Creek RNA	BLM
Tholurna dissimilis	Lichen	2	Mt Hood WA	FS
Tricholomopsis fulvescens	Fungus	2-x		

Calochortus umpquaensis (Umpqua mariposa lily). Photo by Eric Baxter.

CHAPTER 14. EAST CASCADES ECOREGION

The East Cascades Ecoregion is a transition zone that extends from below the crest of the Cascade Range east to where the ponderosa pine zone meets the sagebrush-juniper steppe. The ecoregion also extends north into Washington and south into California. In Oregon, the ecoregion is variable, including extensive lodgepole forests on deep Mazama ash, the montane and foothill Ponderosa pine forests, Klamath Basin lakes, wetlands, sagebrush and diverse montane forests.

The eastern slopes of the Cascades are drier than the Western Slopes, with annual rainfall ranging from 14-26 inches per year. It is less steep and cut by fewer streams than the west. The northern two-thirds of the East Cascades are drained by the Deschutes River system, which includes a series of large lakes and reservoirs near its headwaters. The southern third is drained by the Klamath River, which flows south and west into California. The Klamath Basin, which extends into the Modoc Plateau in California, is a broad, relatively flat mid-elevation valley that historically supported a vast expanse of lakes and marshes. Oregon's largest lake, Upper Klamath Lake, is the biggest remnant of this wetland system. Most of the basin's wetlands have been drained and converted to agriculture.

The mountains on the northern and eastern edges of the Klamath Basin lack a generally accepted name, but include a series of peaks and ridges extending from Paulina Peak near Bend southward through the headwaters of the Williamson, Sprague and Chewaucan rivers to the Warner Mountains east of Lakeview. These mountains are generally forested, but the valleys and flats between them include large marshes, irrigated meadows and pastures and arid juniper and sagebrush steppes. These habitats are a critical part of the Pacific flyway, supporting vast number of shorebirds and waterfowl, the densest wintering concentration of bald eagles in the world, and many other wildlife species.

Also of ecological significance is the ecological zone found at the northern end of this region in Oregon, where the Columbia River Gorge contains a wealth of diversity. This Columbia Gorge transition zone, the extensive Ponderosa pine forests and woodlands and the vast wetlands of the Klamath and upper Deschutes basin characterize this region.

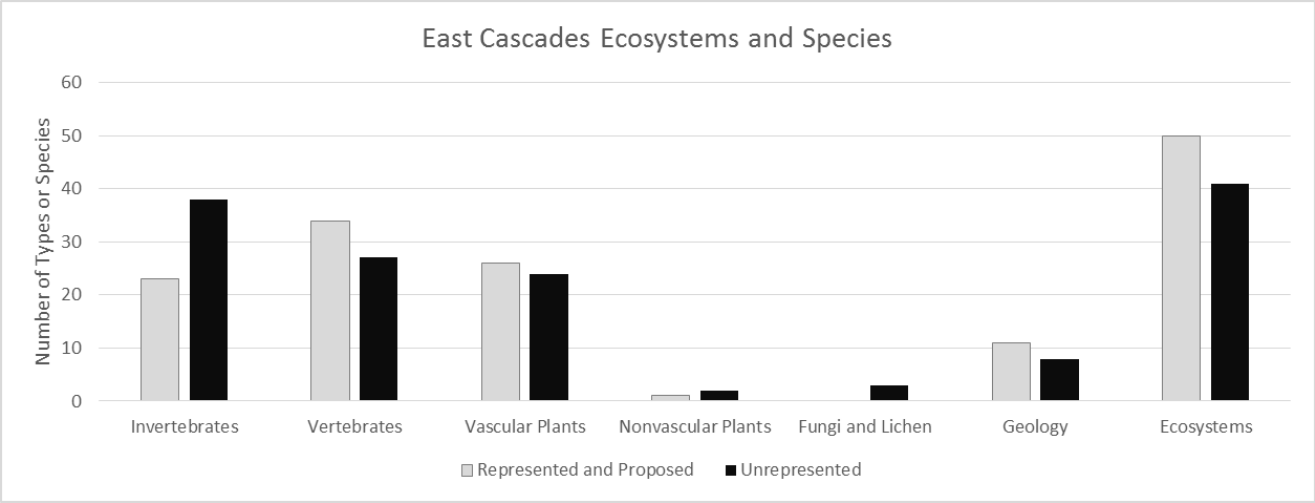


Figure 20. East Cascades Represented and Unrepresented Ecosystems and Species.

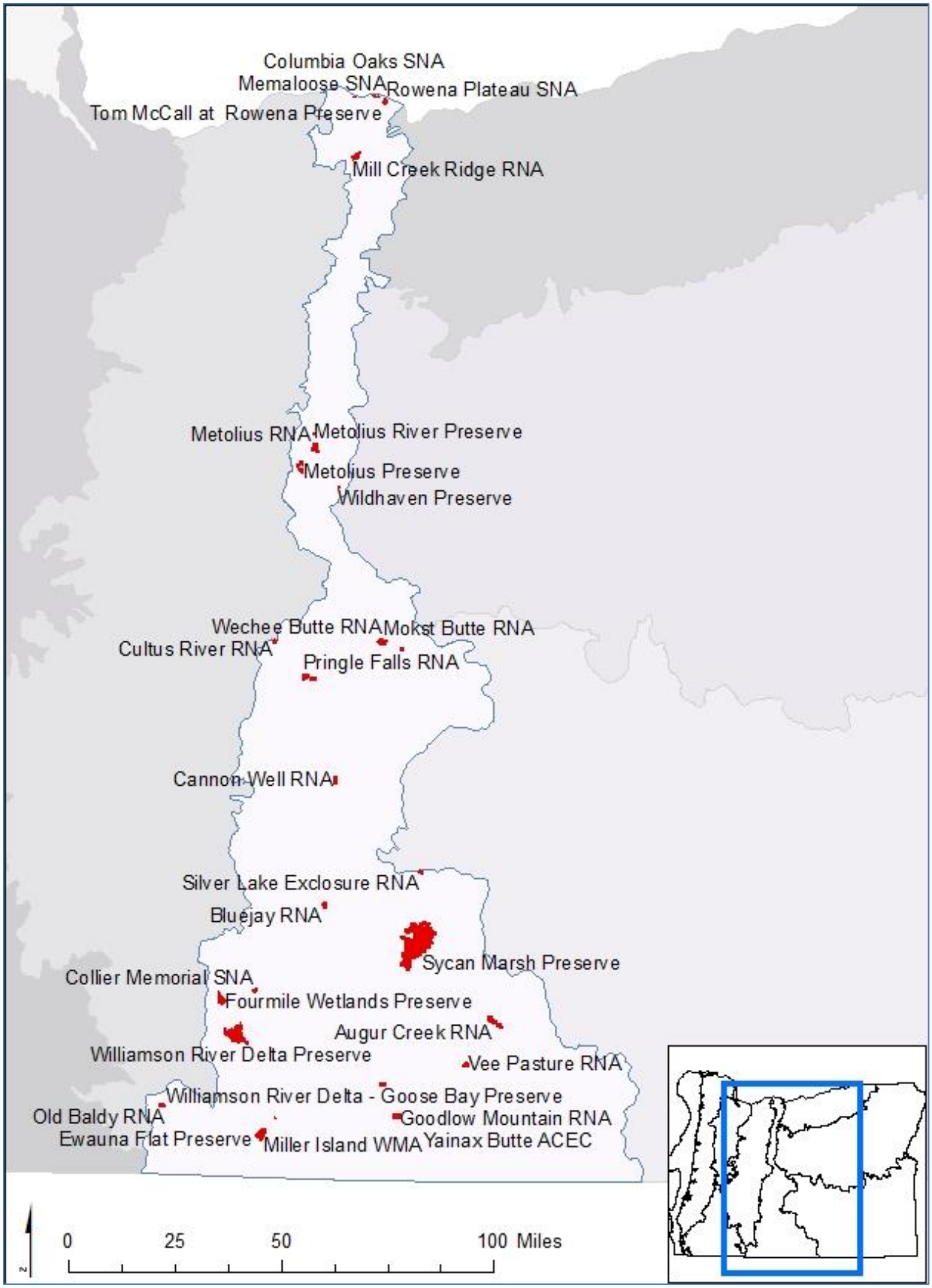


Figure 21. Map of protected areas in the East Cascades Ecoregion.

Forest Analysis

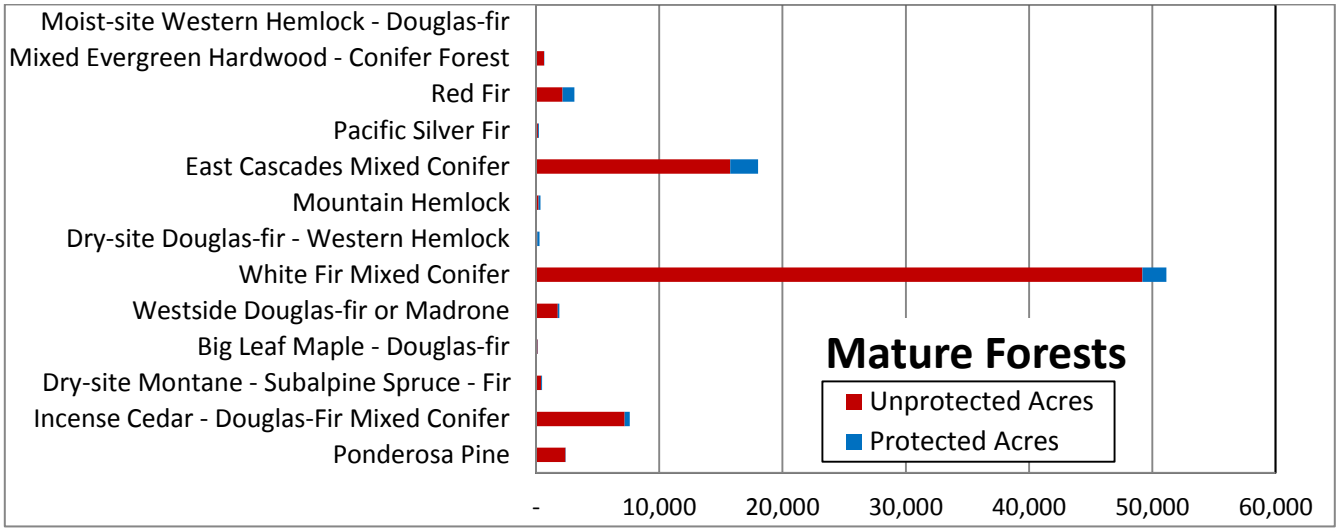


Figure 22. Acreage of protected and unprotected mature forests in the East Cascade Ecoregion.

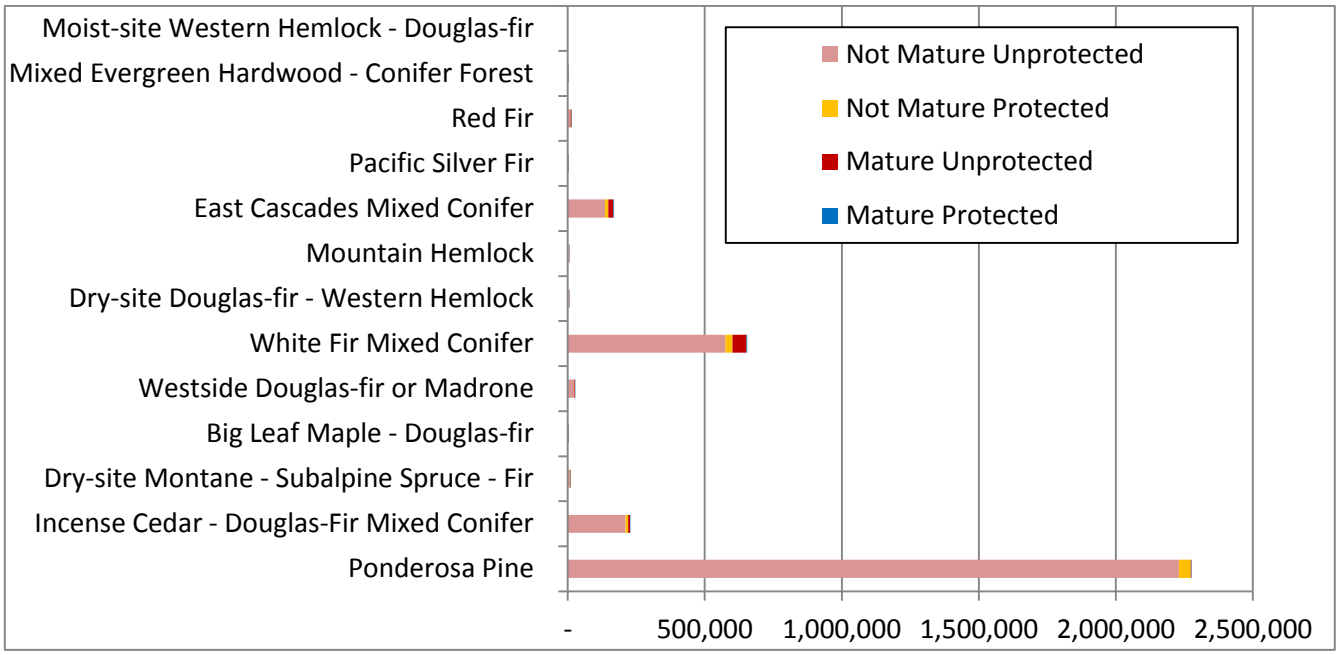


Figure 23. Acreage of forest Ecological Systems in the East Cascades Ecoregion.

The 2010 plan listed 92 ecosystem types in the East Cascades, of which 48 were adequately represented on natural areas. Of the 44 types not adequately represented, 19 were terrestrial forest types. The analysis shows that less than 0.4% of the Ponderosa pine forests in this ecoregion are protected, and in late successional conditions. The imputation data probably is not quite as accurate in the open pine woodlands as it is in the other forests, but this is by far the lowest value of any forest type in any ecoregion, with only 2,500 acres, out of 2,200,000 acres of mature pine remaining in the ecoregion, and this does not include the areas historically dominated by Ponderosa pine which have become grand fir - mixed conifer forests. There are 4 adequately represented Ponderosa ecosystems in the plan, and 3 not adequately protected, all 3 being Ponderosa pine / sagebrush communities. There should be areas in which these types can be found and designated as natural areas.

There are also two other Ponderosa pine – white fir mixed conifer types that are unprotected, out of the 5 in the plan, both types described from the Fremont and Winema Forest. The ecological systems analysis shows only 657 acres of old condition Mixed Evergreen Hardwood – Conifer forest, which could be this last type, suggesting all of the pine and pine-mixed conifer types be priorities to identify and designate new sites as natural areas.

There are two Ponderosa pine – oak ecosystem types not currently represented on natural areas. One, Ponderosa pine-Oregon white oak woodland, is best protected on the east side of the Mount Hood or in the Columbia Gorge, and could possibly be represented on private land trust properties. The second is Oak-Pine with California black oak, which can only be protected on BLM lands or Winema NF lands in southwestern Klamath County. There are sites in the Klamath River Canyon with rare species that can represent this type. A third type, the Oregon white oak canyon riparian with bittercherry, serviceberry or red-osier dogwood, also needs representation, which could occur either on BLM lands in Klamath County, or on USFS or private lands in Hood River or Wasco Counties.

Four grand fir ecosystem types are needing representation, all of which are probably going to need to be represented on the east side of the Mount Hood National Forest, or possibly on the northern Deschutes National Forests. The analysis shows 18,000 acres of mature grand fir forest remains in this area. There is one only one unprotected white fir type, White fir/snowbrush-squawcarpet ceanothus, and there are 50,000 acres of mature white fir forest remaining, so this should be available to find.

Lastly, the mapping shows 76,000 acres of mature forest in the Southwestern Oregon Mixed Conifer ecological system remain in the southern portions of the East Cascades Ecoregion, characterized by Douglas-fir, incense cedar, and sugar pine; and there are no ecosystem types in the plan for these forests. Given that many of these are may support populations of the spotted owl, identifying potential areas for at least a few of them, and including new types for them in the plan makes sense.

Sycan River, photo © Larry Olson.

Agency	Priority		Ecosystem Name	Present Representation
			Western Juniper	
	*	1.	Western juniper/big sagebrush/Idaho fescue.	Goodlow Mountain RNA Silver Lake Exclosure RNA
FS, BLM	H	2.	Western juniper/big sagebrush/bluebunch wheatgrass.	
	*	3.	Western juniper/big sagebrush-bitterbrush/Idaho fescue-western needlegrass.	Peck's Milkvetch ACEC
	*	4.	Western juniper/bitterbrush/bluebunch wheatgrass-Thurber's needlegrass.	Wildhaven Preserve TNC, Whychuss Canyon Preserve DLT
	*	5.	Western juniper/low sagebrush/Idaho fescue and bluebunch wheatgrass communities.	Vee Pasture RNA
			Ponderosa Pine	
	*	6.	Ponderosa pine-western juniper/bitterbrush/Idaho fescue.	Silver Lake Exclosure RNA
	*	7.	Ponderosa pine/bitterbrush/western needlegrass and long-stolon sedge communities.	Pringle Falls RNA Bluejay RNA
	*	8.	Ponderosa pine/bitterbrush/Idaho fescue.	Metolius RNA and Preserve TNC
	*	9.	Ponderosa pine/snowbrush-bitterbrush.	Goodlow Mountain RNA and Metolius River Preserve TNC
	*	10.	Ponderosa pine/greenleaf manzanita-bitterbrush.	Metolius RNA and Preserve TNC Goodlow Mountain RNA
FS	H	11.	Ponderosa pine/big sagebrush-bitterbrush.	
FS	H	12.	Ponderosa pine/big sagebrush/bunchgrass.	
FS	H	13.	Ponderosa pine/mounain big sagebrush/bunchgrass.	
			Lodgepole Pine	
	*	14.	Lodgepole pine/bitterbrush/western needlegrass.	Cannon Well RNA, Pringle Falls RNA
	*	15.	Lodgepole pine/bitterbrush/long-stolon sedge	Cannon Well RNA, Bluejay RNA
	*	16.	Lodgepole pine/bitterbrush/Idaho fescue.	Pringle Falls RNA
FS	M	17.	Lodgepole pine/bitterbrush-squawcurrent.	
	*	18.	Lodgepole pine/grouse huckleberry.	Cherry Basin RNA, Cache Mountain RNA
FS	M	19.	Lodgepole pine/big sagebrush.	
FS	M	20.	Lodgepole pine/pinemat manzanita.	
FS	M	21.	Lodgepole pine/long-stolon sedge.	
FS	M	22.	Lodgepole pine/western needlegrass.	
	*	23.	Lodgepole pine/kinnikinnik.	Cultus River RNA Bluejay RNA
	*	24.	Lodgepole pine/beargrass.	Cache Mountain RNA
	+	25.	Whitebark pine-lodgepole pine forest.	Augur Creek RNA

Agency	Priority		Ecosystem Name	Present Representation
			Grand Fir	
	+	26.	Englemann spruce bottomland with ponderosa and lodgepole pine.	Cultus River RNA
	*	27.	Grand fir-Englemann spruce/starry solomon seal.	Gumjuwac-Tolo RNA
	*	28.	Grand fir/skunkleaf polemonium.	Gumjuwac-Tolo RNA
FS	H	29.	Grand fir/vanilla leaf.	
FS, PRD	M	30.	Grand fir/elk sedge.	
FS	M	31.	Grand fir/twinflower	
FS, PRD	M	32.	Grand fir/snowberry, if possible with ridgetops containing oceanspray and other dry shrubs.	
			Mixed Conifer	
	+	33.	Ponderosa pine-white fir/snowberry.	Augur Creek RNA
	*	34.	Ponderosa pine-white fir/green manzanita/western needlegrass.	Goodlow Mountain RNA Pringle Falls RNA
	+	35.	Ponderosa pine-white fir/snowbrush.	Augur Creek RNA
FS	H	36.	Ponderosa pine-white fir/snowbrush-greenleaf manzanita.	
FS	H	37.	Ponderosa pine-white fir/chinkquapin forest, with snowbrush and boxwood if possible.	
FS	H	38.	White fir/snowbrush-squawcarpet ceanothus.	
	*	39.	White fir-Douglas fir/snowbrush.	Cherry Basin RNA
	*	40.	White fir-Douglas fir/snowberry.	Cherry Basin RNA
FS	H	41.	Douglas fir-Pacific silver fir forest.	
	*	42.	White fir-Pacific silver fir/snowberry.	Cache Mountain RNA
	*	43.	White fir-red fir/long-stolon sedge or prince's pine forest with chinkapin if possible.	Cherry Basin RNA
	*	44.	Red fir-mountain hemlock/pinemat manzanita with mountain hemlock/grouseberry if possible.	Cherry Basin RNA
			Grasslands and Shrubland Steppe	
	*	45.	Bluebunch wheatgrass-Sandberg bluegrass.	Mill Creek RNA
	*	46.	Idaho fescue-hawkweed.	Tom McCall Preserve at Rowena TNC
	*	47.	Mountain big sagebrush-bitterbrush/Idaho fescue.	Peck's Milkvetch ACEC
FS, BLM	L	48.	Mountain big sagebrush/bunchgrass.	
	*	49.	Low sagebrush vegetation complex, with Idaho fescue, bluegrass, and bluebunch wheatgrass.	Vee Pasture RNA
PVT	H	50.	Bitterbrush with bluebunch wheatgrass and Idaho fescue.	

Agency	Priority		Ecosystem Name	Present Representation
PVT, BLM	H	51.	Big sagebrush, greasewood or meadow (Nevada bluegrass or basin wildrye) complex.	
			Special Types	
	*	52.	Oregon white oak/bitterbrush/bluebunch wheatgrass.	Mill Creek RNA
FS, PRD	H	53.	Ponderosa pine-Oregon white oak woodland.	*Mayer State Park*
BLM	M	54.	Oak-Ponderosa pine woodland, with California black oak.	
FS	L	55.	Dry site Douglas fir with oceanspray, western fescue, and snowberry.	
BLM FS	M	56.	Oregon white oak canyon riparian with bittercherry, serviceberry or red-osier dogwood.	
	+	57.	Entire undisturbed cinder cone at mid-elevations with ponderosa pine-lodgepole pine climax.	Wechee Butte RNA
	*	58.	Entire undisturbed forested cinder cone, in white fir zone; pre-Mazama.	Moskt Butte RNA
	+	59.	Entire forested cinder cone, in white fir zone; post-Mazama.	Katsuk Butte RNA
	*	60.	Entire undisturbed cinder cone in mountain hemlock zone.	Moskt Butte RNA
			Lacustrine and Riverine	
	*	61.	Mid-montane lake, with aquatic beds and marshy shore.	Cache Mountain RNA
	*	62.	Upper montane lake, with aquatic beds and marshy shore.	Cherry Basin RNA
	+	63.	Flowing and pooled cold springs.	Cultus River RNA
PVT, FS	U	64.	Flowing and pooled hot springs.	
PVT, FS	U	65.	Mare's egg springs.	
			Palustrine	
	*	66.	Vernal pond at mid to high elevation	Sycan Marsh Preserve TNC
	*	67.	Subalpine pond.	Cherry Basin RNA
	*	68.	Bulrush-pondlily marsh with aquatic beds.	Sycan Marsh Preserve TNC
	*	69.	Few flowered spikerush/brown moss fen.	Sycan Marsh Preserve TNC
	*	70.	Forb flush on seepage slope (including shooting-star, bistort, arrowleaf groundsel and false hellebore).	Sycan Marsh Preserve TNC
FWS, FS	M	71.	Beaked sedge marsh.	
	*	72.	Slender wooly sedge marsh.	Big Marsh
	*	73.	Creeping spikerush meadow.	Sycan Marsh Preserve TNC
	*	74.	Cusick or Nevada bluegrass meadow.	Sycan Marsh Preserve TNC Bluejay RNA
	*	75.	Tufted hairgrass meadow, with lodgepole pine and sedge at margin.	Sycan Marsh Preserve TNC

Agency	Priority		Ecosystem Name	Present Representation
FS	M	76.	Undergreen willow-mountain willow shrub swamp.	
FS	M	77.	Booth willow-Geyer willow shrub swamp.	
	*	78.	Bog blueberry shrub-swamp, with lodgepole pine and tufted hairgrass.	Sycan Marsh Preserve TNC
	*	79.	Silver sagebrush/Nebraska sedge-Cusick bluegrass playa.	Sycan Marsh Preserve TNC
BLM	H	80.	Mountain alder-redosier dogwood riparian.	
FS	H	81.	Black cottonwood/mountain alder riparian.	
FS	H	82.	Mountain alder-Douglas spiraea riparian.	
FS	H	83.	Mountain alder-snowberry riparian.	
PVT, FS	M	84.	Geyer willow-Lemmon willow riparian.	
FS	H	85.	Booth willow riparian with mountain willow or Lemmon willow.	
BLM	M	86.	Pacific willow-coyote willow riparian.	
FS	M	87.	Geyer willow and Lemmon willow riparian.	
FS	H	88.	Black cottonwood riparian, with widefruit sedge if possible.	
FS	M	89.	Engelmann spruce/widefruit sedge swamp.	
	*	90.	Lodgepole pine-quaking aspen/Douglas spiraea woodland.	Bluejay RNA

Tule – Cattail Marsh at Lower Klamath Marsh Wildlife Refuge (USFWS photo).

EAST CASCADES GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Holocene	
	M	1.	Active Fault Plane	*Modoc Point*
	*	2.	Ash-Dammed Marsh	Klamath Marsh NWR
FS	H	3.	Metolius Springs	*Metolius Headwater Springs*
	*	4.	Mazama Ash	Collier State Park
	*	5.	Mima Mounds	Mayer State Park, Tom McCall Preserve at Rowena TNC
			Pleistocene	
FS, PVT	M	6.	Shevlin Park Tuff	*Bend*
	*	7.	Tumalo Ash-Flow Tuff	Bull Flat ACEC
BLM, FS	M	8.	Bend Air-Fall Pumice	*Bend*
FS	M	9.	Desert Spring Tuff	
			Pleistocene and Pliocene	
	*	10.	Lava Butte Cinder Cone	Lave Butte SIA
	*	11.	Newberry Shield Volcano	Newberry Crater NM
	*	12.	Newberry Crater	Newberry Crater NM
	*	13.	Newberry Lava Caves And Tubes	Newberry Crater NM
	H	14.	Lava-Dammed Lake	*Sparks Lake*
	*	15.	Hole-In-The-Ground Maar	Fort Rock State Park
			Pliocene and Miocene	
FS	L	16.	Yonna Formation	*Merrill*
	*	17.	Deschutes Formation	Cove Palisades State Park
			Miocene	
	*	18.	Simtustus Formation	Cove Palisades State Park
FS	L	19.	Palagonitic Tuff	*Devil's Garden*

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Invertebrates				
Agonum belleri	Beller's ground beetle	2		
Anodonta californiensis	California floater (mussel)	2		
Anodonta nuttalliana	Winged floater (mussel)	2		
Bombus occidentalis	Western bumblebee	2		
Calliopsis barri	A miner bee	2		
Callophrys johnsoni	Johnson's hairstreak (butterfly)	1		
Cicindela columbica	Columbia River tiger beetle	1-x		
Colligyrus sp. 4	Columbia duskysnail	1		
Colligyrus sp. 5	Klamath duskysnail	1	*Williamson River*	
Colligyrus sp. 7	Mare's egg duskysnail	1	Kimball State Park	ORPD
Colligyrus sp. 8	Nodose duskysnail	1	*Ouxy Spring*	
Cryptomastix devia	Puget oregonian (snail)	1		
Cryptomastix hendersoni	Columbia Gorge oregonian (snail)	1		
Fluminicola modoci	Modoc pebblesnail	1		
Fluminicola sp. 10	Metolius pebblesnail	1		
Fluminicola sp. 11	Nerite pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 12	Odessa pebblesnail	1		
Fluminicola sp. 13	Ouxy Spring pebblesnail	1	*Ouxy Spring*	
Fluminicola sp. 14	Tall pebblesnail	1	*Harriman Spring*	
Fluminicola sp. 15	Tiger lily pebblesnail	1		
Fluminicola sp. 16	Toothed pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 18	Wood River pebblesnail	1	Kimball State Park, Klamath State Fish Hatchery	PRD, OFW
Fluminicola sp. 19	Keene Creek pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 2	Casebeer pebblesnail	1		
Fluminicola sp. 20	Crooked Creek pebblesnail	1	Kimball State Park	PRD
Fluminicola sp. 3	Diminutive pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 4	Fall Creek pebblesnail	1	Cascade-Siskiyou NM	BLM
Fluminicola sp. 5	Klamath pebblesnail	1	Upper Klamath NWR	FWS
Fluminicola sp. 6	Klamath Rim pebblesnail	1	Upper Klamath NWR	FWS
Fluminicola sp. 7	Lake of the Woods pebblesnail	1		
Fluminicola sp. 8	Lost River pebblesnail	1		

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Fluminicola turbiniformis	Turban pebblesnail	1		
Gonidea angulata	Western ridged mussel	2	Collier Memorial SP	PRD
Helisoma newberryi newberryi	Great Basin ramshorn (snail)	1		
Juga acutifilosa	Scalloped juga (snail)	1	Cascade-Siskiyou NM	BLM
Juga hemphilli dallesensis	Dalles juga (snail)	1		
Juga hemphilli ssp. 1	Indian Ford juga (snail)	1		
Juga sp. 1	Basalt juga (snail)	1		
Juga sp. 2	Blue Mountains juga (snail)	1	Upper Klamath River WSR	BLM
Juga sp. 7	Three-band juga (snail)	1		
Lanx alta	Highcap lanx (snail)	1	Collier State Park	PRD
Lanx klamathensis	Scale lanx (snail)	1	Upper Klamath River WSR	BLM
Monadenia fidelis minor	Oregon snail (Dalles sideband)	1	Badger Creek WA	FS
Monadenia fidelis ssp. 11	Modoc Rim sideband (snail)	1		
Perdita accepta	A miner bee	1		
Perdita salicis sublaeta	A miner bee	1		
Philotiella leona	Leona's little blue (butterfly)	1		
Pisidium sp. 1	Modoc peaclam	1	Upper Klamath NWR	FWS
Pisidium ultramontanum	Montane peaclam	1		
Plebejus podarce klamathensis	Gray blue (butterfly)	2		
Pristiloma crateris	Crater Lake tightcoil (snail)	1	Metolius WSR	FS
Pristiloma wascoense	Shiny tightcoil (snail)	2		
Prophysaon sp. 1	Klamath tail-dropper (slug)	1	Upper Klamath WSR	BLM
Pyrgulopsis archimedis	Archimedis springsnail	1	Klamath WMA, Upper Klamath NWR	FWS, OFW
Pyrgulopsis sp. 7	Lost River springsnail	1		
Pyrgulopsis sp. 9	Klamath Lake springsnail	1		
Vespericola sierranus	Siskiyou hesperian (snail)	1	Cascade-Siskiyou NM	BLM
Vorticifex effusa dalli	Dall's ramshorn (snail)	1	*Upper Klamath Lake*	
Vorticifex effusa diagonalis	Lined ramshorn (snail)	1	Collier State Park, Klamath State Fish Hatchery	PRD, OFW
Vorticifex klamathensis klamathensis	Klamath ramshorn (snail)	1	Upper Klamath NWR	FWS
Vorticifex klamathensis sinitsini	Sinitsin ramshorn (snail)	1		

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Fish				
Catostomus microps	Modoc sucker	1		FS
Catostomus occidentalis lacusanserinus	Goose Lake sucker	1		FS
Catostomus rimiculus pop. 1	Jenny Creek sucker	1	Cascade-Siskiyou NM	BLM
Chasmistes brevirostris	Shortnose sucker	1	Williamson River Delta Preserve , Miller Creek ACEC, Upper Klamath Lake NWR	TNC, BLM, FWS
Cottus pitensis	Pit sculpin	2		
Deltistes luxatus	Lost River sucker	1	Williamson River Delta Preserve, Upper Klamath NWR	TNC, FWS
Entosphenus tridentatus ssp. 1	Goose Lake lamprey	1		
Gila bicolor oregonensis	Oregon Lakes tui chub	1		FS
Gila bicolor thalassina	Goose Lake tui chub	1		
Lavinia symmetricus mitrulus	Pit roach	2		
Oncorhynchus clarkii pop. 2	Coastal cutthroat trout (Southwestern Washington /Columbia River ESU)	1	Hood River, Middle Fork WSR	FS
Oncorhynchus kisutch pop. 1	Coho salmon (Lower Columbia River ESU)	1	Hood River, Middle Fork WSR	FS
Oncorhynchus mykiss pop. 26	Steelhead (Lower Columbia River ESU, summer run)	1	Hood River, Middle Fork WSR	FS
Oncorhynchus mykiss pop. 27	Steelhead (Lower Columbia River ESU, winter run)	1	Hood River, Middle Fork WSR	FS
Oncorhynchus mykiss pop. 28	Steelhead (Middle Columbia River ESU, summer run)	1		
Oncorhynchus mykiss pop. 29	Steelhead (Middle Columbia River ESU, winter run)	1	Fifteen Mile Creek WSR	FS
Oncorhynchus mykiss pop. 4	Warner Valley redband trout	1		FS
Oncorhynchus mykiss pop. 6	Goose Lake redband trout	1		FS
Oncorhynchus tshawytscha pop. 18	Chinook salmon (Deschutes River ESU, summer/fall run)	1		
Oncorhynchus tshawytscha pop. 21	Chinook salmon (Lower Columbia River ESU, spring run)	1		
Oncorhynchus tshawytscha pop. 22	Chinook salmon (Lower Columbia River ESU, fall run)	1		
Salvelinus confluentus pop. 1	Bull trout (Klamath River population)	1	Sycan Marsh Preserve, Gearhart Mountain WA, Crater Lake National Park	TNC, FS, NPS
Salvelinus confluentus pop. 18	Bull trout (Deschutes SMU)	1	Metolius River WSR	FS
Salvelinus confluentus pop. 21	Bull trout (Hood River SMU)	1	Hood River, Middle Fork WSR	FS

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Amphibians				
Dicamptodon copei	Cope's giant salamander	2	Badger Creek WA	FS
Rana pretiosa	Oregon spotted frog	1	Upper Deschutes WSR, Klamath Marsh NWR	FS, FWS
Reptiles				
Actinemys marmorata	Western pond turtle	2	Klamath River State Scenic Waterway, Klamath WMA, Miller Island WMA	BLM, OFW
Birds				
Agelaius tricolor	Tricolored blackbird	2	Miller Island WMA, Wood River ACEC	OFW, BLM
Anser albifrons elgasi	Tule goose	1		
Bartramia longicauda	Upland sandpiper	2	Sycan Marsh Preserve	TNC
Bucephala albeola	Bufflehead	2	Crane Prairie WMA	FS
Centrocercus urophasianus	Greater sage-grouse	2		FS
Charadrius nivosus nivosus	Western snowy plover	2	Lower Klamath NWR	FWS
Coccyzus americanus	Yellow-billed cuckoo	2-x		
Coturnicops noveboracensis	Yellow rail	2	Fourmile Wetlands Preserve, Klamath Marsh NWR, Sycan Marsh Preserve, Wood River ACEC, Upper Klamath NWR	FWS TNC BLM
Cygnus buccinator	Trumpeter swan	2		
Egretta thula	Snowy egret	2	Upper Klamath NWR	FS
Falco columbarius	Merlin	2-x		
Falco peregrinus anatum	American peregrine falcon	2	Columbia Oaks State Natural Area	PRD
Histrionicus histrionicus	Harlequin duck	2		FS
Melanerpes lewis	Lewis's woodpecker	2	Klamath River State Scenic Waterway, Upper Klamath NWR, White River WMA	BLM, OFW, FWS
Parkesia noveboracensis	Northern waterthrush	2	Crescent Creek WSR, Upper Klamath WSR	FS, BLM
Pelecanus erythrorhynchos	American white pelican	2	Upper Klamath NWR, Klamath Marsh NWR	FS, FWS
Picoides albolarvatus	White-headed woodpecker	2	Gearhart Mountain WA, Metolius River WSR, Metolius RNA	FS
Podiceps auritus	Horned grebe	2	Sycan Marsh Preserve	TNC
Podiceps grisegena	Red-necked grebe	2	Klamath Marsh NWR, Upper Klamath NWR	FWS FS

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Progne subis	Purple martin	2	Upper Klamath NWR, Rowena Plateau SNA	FWS, PRD
Strix occidentalis caurina	Northern spotted owl	1	Badger Creek WA, Mt. Jefferson WA, Sky Lakes WA, Pringle Falls RNA	FS, NPS
Tympanuchus phasianellus columbianus	Columbian sharp-tailed grouse	2		FS
Mammals				
Antrozous pallidus	Pallid bat	2	Memaloose State Park	PRD
Brachylagus idahoensis	Pygmy rabbit	2	Slide Mt SIA	FS
Canis lupus	Gray wolf	2	Crane Prairie WMA, Sycan Marsh Preserve, Sky Lakes WA, Cascade-Siskiyou NM	TNC, FS, BLM
Corynorhinus townsendii	Townsend's big-eared bat	2	Columbia Gorge NSA, Lava River Caves State Park, Metolius River State Scenic Waterway	PRD, FS
Gulo gulo	Wolverine	2		
Lynx canadensis	Canada lynx	2		FS
Myotis thysanodes	Fringed myotis	2		BLM
Ovis canadensis nelsoni	Desert bighorn sheep	2-x		
Pekania pennanti	Fisher	2	Deschutes River State Scenic Waterway, Oregon Cascades Recreation Area, Three Sisters WA, Katsuk Butte RNA	FS
Ursus arctos horribilis	Grizzly bear	2-x		
Vulpes macrotis	Kit fox	2		
Vulpes vulpes necator	Sierra Nevada red fox	1		
Vascular Plants				
Agoseris elata	Tall agoseris	2	Metolius River State Scenic Waterway, Mt Hood WA	FS
Asplenium septentrionale	Grass-fern	2		FS
Astragalus applegatei	Applegate's milk-vetch	1	Ewauna Flat Preserve, Klamath WMA	TNC, FWS
Astragalus californicus	California milk-vetch	2	Upper Klamath River WSA, Upper Klamath River ACEC	BLM
Astragalus hoodianus	Hood River milk-vetch	2	Columbia Gorge NSA, Mayer State Park, Tom McCall Preserve at Rowena	PRD, TNC
Astragalus lemmonii	Lemmon's milk-vetch	1		
Astragalus misellus var. *misellus*	Pauper milk-vetch	1		

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Astragalus peckii	Peck's milk-vetch	1		BLM, FS
Boechera atrorubens	Sickle-pod rockcress	2	Mill Creek RNA	FS
Botrychium montanum	Mountain grape-fern	2	Badger Creek WA	
Botrychium pumicola	Pumice grape-fern	1	Three Sisters WA, Newberry National Volcanic Monument	FS
Calochortus greenei	Greene's mariposa-lily	1	Soda Mt. WA	BLM
Carex capitata	Capitate sedge	2	Sycan Marsh Preserve	TNC
Carex comosa	Bristly sedge	2		
Carex davyi	Dry-spike sedge	2		
Carex diandra	Lesser panicled sedge	2		FS
Carex duriuscula	Involute-leaved sedge	2-x	Sycan Marsh Preserve	TNC
Carex lasiocarpa var. *americana*	Slender wooly sedge	2	Big Marsh	FS
Carex vernacula	Native sedge	2	*Drakes Peak*	
Castilleja chlorotica	Green-tinged paintbrush	1	Gearhart Mountain WA, Augur Creek RNA	FS
Castilleja thompsonii	Thompson's paintbrush	2		FS
Cicuta bulbifera	Bulb-bearing water-hemlock	2-x	Upper Klamath NWR	FWS
Cryptantha simulans	Pine woods cryptantha	2		
Cyperus acuminatus	Short-pointed cyperus	2		
Delphinium nuttallii	Nuttall's larkspur	2		FS
Eleocharis bolanderi	Bolander's spikerush	2		
Erigeron oreganus	Oregon daisy	1		
Eriogonum prociduum	Prostrate buckwheat	1		BLM, FS
Eriogonum umbellatum var. *glaberrimum*	Green buckwheat	1	Sycan River WSR, Gearhart Mt. WA	FS
Galium serpenticum ssp. *warnerense*	Warner Mountain bedstraw	1	*Drakes Peak*	FS
Gentiana newberryi var. *newberryi*	Newberry's gentian	2		FS
Gratiola heterosepala	Boggs Lake hedge-hyssop	1		
Heliotropium curassavicum	Salt heliotrope	2		
Ivesia shockleyi	Shockley's ivesia	2	*Drakes Peak*	FS
Juncus tiehmii	Tiehm’s rush	2		
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadow-foam	1	Cascade-Siskiyou NM	BLM
Lipocarpha aristulata	Aristulate lipocarpha	2		

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Lobelia dortmanna	Water lobelia	2	Metolius River State Scenic Waterway	
Lomatium suksdorfii	Suksdorf's lomatium	1		BLM
Lomatium watsonii	Watson's desert-parsley	2		BLM, FS
Lycopodiella inundata	Northern bog clubmoss	2		
Meconella oregana	White meconella	1	Tom McCall Preserve at Rowena, Koberg Beach State Park, Mayer State Park, Memmaloose State Park	TNC, PRD
Melica stricta	Nodding melic	2		
Mimulus evanescens	Disappearing monkeyflower	1	*Drews Reservoir*	
Mimulus tricolor	Three-colored monkeyflower	2	Sycan Marsh Preserve	TNC
Penstemon barrettiae	Barrett's penstemon	1	Koberg Beach State Park	PRD
Penstemon glaucinus	Blue-leaved penstemon	1	Yainax Butte ACEC, Deadhorse Rim-Whitebark Pine RNA, Slide Mountain SIA	BLM, FS
Penstemon peckii	Peck's penstemon	1	Metolius River Preserve TNC	TNC
Perideridia erythrorhiza	Red-root yampah	1		FS
Phacelia inundata	Playa phacelia	1		
Pilularia americana	American pillwort	2		BLM
Plagiobothrys salsus	Desert allocarya	2		FS
Pleuropogon oregonus	Oregon semaphore grass	1	*Mud Creek*	
Pogogyne floribunda	Profuse-flowered pogogyne	2		
Potamogeton diversifolius	Rafinesque's pondweed	2		
Potamogeton fibrillosus	Fibrous pondweed	2-x		
Ranunculus triternatus	Dalles Mt. buttercup	1		BLM
Rorippa columbiae	Columbia cress	1		
Rotala ramosior	Toothcup	2		
Salix laevigata	Polished willow	2-x		
Americana.	Scheuchzeria	2		FS
Schoenoplectus subterminalis	Water clubrush	2	Big Marsh	FS
Scirpus pendulus	Drooping bulrush	2		
Suksdorfia violacea	Violet suksdorfia	2	Columbia Gorge NSA,Mayer State Park, Memaloose State Park	FS, PRD
Thelypodium brachycarpum	Short-podded thelypody	2	Klamath WMA, Lower Klamath NWR	
Thelypodium howellii ssp. *howellii*	Howell's thelypody	1		

EAST CASCADES SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Utricularia minor	Lesser bladderwort	2	Big Marsh	FS
Wolffia borealis	Dotted water-meal	2	Wood River Wetland ACEC	BLM
Nonvascular Plants				
Cephaloziella spinigera	Liverwort	2		
Pseudocalliergon trifarium	Moss	2	Sycan Marsh Preserve	TNC
Schistidium cinclidodonteum	Moss	2		
Fungi				
Lyophyllum piceum	Fungus	1-X		
Pseudorhizina californica	Fungus	2		
Rhizopogon oswaldii	Fungus	2-x		

Harlequin ducks (*Histrionicus histrionicus*) photo by Peter Masses

CHAPTER 15. COLUMBIA BASIN ECOREGION

The Oregon portion of the Columbia Basin Ecoregion is sometimes referred to as the Umatilla Plateau. It extends from the eastern slopes of the Cascades Mountains south and east from the Columbia River to the Blue Mountains. The region continues northward throughout most of eastern Washington, including a small portion of west central Idaho. The region includes the Columbia Basin proper, and the Palouse, which is recognized by many geographers as a separate region.

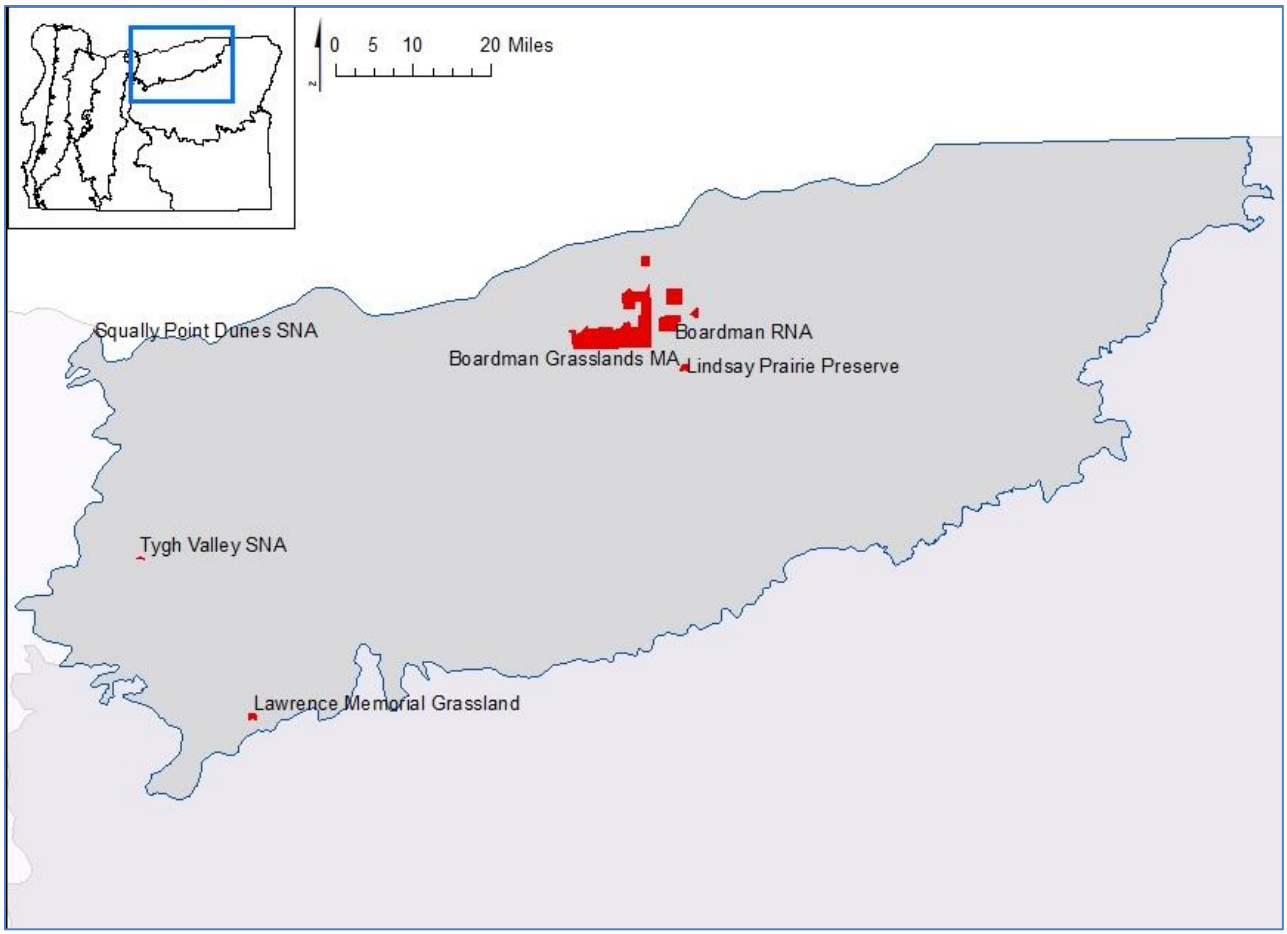


Figure 24. Columbia Basin Ecoregion Natural Areas Map.

The Columbia River, with its historic floods and large deposits of loess (wind-borne silt and sand) from the end of the last ice age, has greatly influenced the region. Most of the Oregon portion of the ecoregion is a lava plateau broken by basalt canyons carved out by the Deschutes, John Day and Umatilla Rivers and other streams that flow into the Columbia. The climate is arid, with cold winters and hot summers. Most of the ecoregion receives less than 15 inches of precipitation per year (some areas as little as eight inches), much of that in the form of snow.

The majority of the ecoregion's natural vegetation is native bunchgrass prairie, often called Palouse prairie because of the deep, loess soils and plentiful grass. The majority of the ecoregion in Washington was originally sagebrush steppe. Sandy deposits along the Columbia River support open dunes, bitterbrush and steppe and western juniper. A few species of ground-squirrel and plants (milkvetch species among others) adapted to these habitats. The rivers are characterized by riparian vegetation, with black cottonwood, willows, chokecherry and aspen dominating riverbanks. Less common are riparian areas dominated by black hawthorn and white alder.

Early travelers along the Oregon Trail found vast natural grasslands broken by brushy draws and tree- and rimrock-bordered streams with numerous springs. Because of the deep productive soils, mild climate (due to low elevations) and the presence of adequate water (either from wells or from the Columbia, Snake and Umatilla rivers), much of this region provided model farmland. The Columbia Basin Ecoregion is second only to the Willamette Valley in the percentage of landscape converted to non-native habitats and human uses. Protected areas and public lands are very limited in this region, with the only vegetation types that have not declined dramatically being found on lands that cannot be farmed: the steep canyon grasslands and scablands.

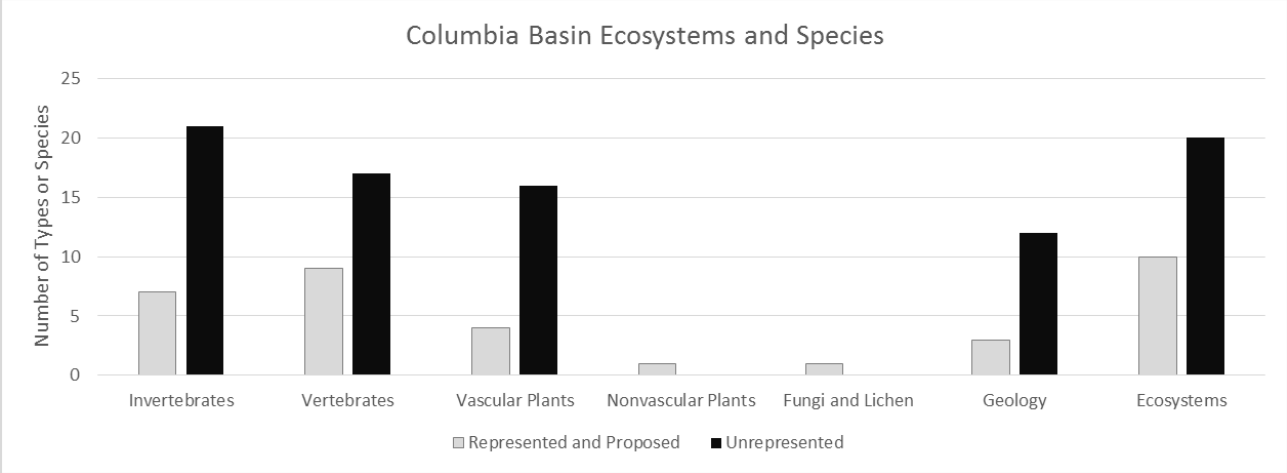


Figure 25. Columbia Basin Represented and Unrepresented Ecosystems and Species.

Sagebrush, bitterbrush, western juniper and grasslands in the Columbia Basin ecoregion..

COLUMBIA BASIN ECOSYSTEMS

Agency	Priority		Ecosystem Name	Present Representation
			Ponderosa Pine and Western Juniper	
FS, BLM	H	1	Ponderosa pine/hawthorn grassland mosaic.	
	+	2	Western juniper/big sagebrush/bunchgrass.	Boardman pRNA addition Boardman Grasslands MA TNC
			Shrub Steppe	
PRD, BLM	H	3	Big sagebrush/Idaho fescue.	*Cottonwood Canyon State Park*
PVT, BLM	H	4	Big sagebrush/needle-and-thread.	*Lindsay Prairie Preserve TNC*
	*	5	Big sagebrush/bluebunch wheatgrass-Sandberg bluegrass.	Boardman RNA
	*	6	Rigid sagebrush/Sandberg bluegrass.	Lawrence Memorial Grassland Preserve TNC
	+	7	Bitterbrush/needle-and-thread.	Boardman Grasslands MA TNC
PVT, FWS	H	8	Big sagebrush-bitterbrush/bunchgrass.	
	I	9	Black hawthorn, snowberry, rose shrubland mosaic.	CTUIR Umatilla Wildlife Lands
			Grasslands	
	*	10	Sandy grasslands (Needle-and-thread-Sandberg bluegrass, downy wheatgrass-needle-and-thread).	Boardman RNA Boardman Grasslands MA TNC
	*	11	Bluebunch wheatgrass-Needle-and-thread-Sandberg bluegrass palouse.	Boardman RNA Lindsay Prairie Preserve TNC
BLM	H	12	Idaho fescue-bluebunch wheatgrass.	*Cottonwood Canyon State Park*
PVT	H	13	Idaho fescue-junegrass.	*Cottonwood Canyon State Park*
PVT, BLM	L	14	Sandberg bluegrass-serrate balsamroot scabland.	
PVT, BLM	L	15	Buckwheat-Sandberg bluegrass scabland.	*Cottonwood Canyon State Park*
PVT, BLM	H	16	Bunchgrass mounds/grassland scabland complex.	*White River Falls State Park*
	*	17	Bunchgrass mounds/rigid sagebrush scabland complex.	Lawrence Memorial Grassland Preserve TNC
PVT, BLM	M	18	Great Basin wildrye.	Possibly extripated
			Special Types	
FWS ACE	U	19	Unstabilized sand dune communities along the Columbia River.	*Umatilla NWR*
	*	20	Unstabilized, inland sand dune series, from active unvegetated dunes through partially stabilized dunes (with bitterbrush, big sagebrush, rabbitbrush, and Indian ricegrass).	Boardman RNA

Agency	Priority		Ecosystem Name	Present Representation
			Lacustrine	
PVT, BLM	U	21	Permanent Pond.	
			Palustrine	
PVT, BLM	H	22	Bare playas with annual forbs and grasses including mousetail and annual foxtail.	
BLM	H	23	Greasewood flats with Great Basin wildrye.	
PVT, OFW	H	24	Riparian dominated by peachleaf willow, coyote willow, or Pacific willow.	*Umatilla River CTUIR Wildlife Area, Cottonwood Canyon State Park*
PVT, BLM	H	25	Riparian dominated by white alder.	
BLM	H	26	Riparian dominated by black hawthorn.	
BLM	H	27	Riparian dominated by western birch, with quaking aspen if possible.	
BLM, PVT	M	28	Black cottonwood/redosier dogwood or rose riparian.	
BLM, PVT	M	29	Black cottonwood/snowberry riparian.	
VT	M	30	Black cottonwood/black hawthorn riparian.	

White alder riparian, big sagebrush and bluebunch wheatgrass in the Columbia Basin.

COLUMBIA BASIN GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Holocene	
ACE, BLM	H	1	Eolian Dunes	Boardman Grasslands MA TNC *Boardman Naval Training Center*
PVT	H	2	Mima Mounds	*Eight Mile Mounds*
			Pleistocene	
	H	3	Flood Bar	*Umatilla Weapons Depot*
	*	4	Flood Scour	Hat Rock State Park
ACE, BLM	H	5	Bar and Crescentric Dunes	*Petersburg*
PVT	M	6	Scabland Topography	*Blalock*
	M	7	Rhythmites (Missoula floods)	*Arlington*
BLM, PVT	M	8	Mt. St. Helens Tephra	*Arlington*
			Pliocene and Miocene	
PVT	L	9	Chenoweth Formation	*Chenoweth Creek*
BLM, FS	L	10	Tygh Valley Formation	*Tygh Valley*
PVT	M	11	Alkali Canyon Formation	*Alkali Canyon*
PVT	L	12	McKay Formation	*McKay Reservoir*
			Miocene	
	*	13	Saddle Mountains Basalt	Hat Rock State Park
PVT	M	14	Wanapum Basalt Formation	*Umatilla River/Pendleton*
BLM, FS	L	15	Grande Ronde Basalt Formation	*Umatilla River/Pendleton*

Saddle Mountain Basalt at Hat Rock State Park.

COLUMBIA BASIN SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Invertebrates				
Anodonta californiensis	California floater (mussel)	2	Deschutes Wild & Scenic River	BLM
Calliopsis barri	A miner bee	2		
Cicindela columbica	Columbia River tiger beetle	1-x		
Colligyrus sp. 4	Columbia duskysnail	1		
Cryptomastix hendersoni	Columbia Gorge oregonian (snail)	1		
Fisherola nuttalli	Shortface lanx (=Giant Columbia River limpet)	1	*Lower Deschutes River WSR*, John Day River WSR	BLM
Fluminicola fuscus	Columbia pebblesnail / spire snail	1	*Lower Deschutes River WSR*	BLM
Fluminicola sp. 17	Tuscan pebblesnail	1		
Gomphus lynnae	Columbia clubtail (dragonfly)	2		
Gonidea angulata	Western ridged mussel	2		
Juga bulbosa	Bulb juga (snail)	1	Deschutes WSR	
Juga hemphilli dallesensis	Dalles juga (snail)	1		
Juga hemphilli maupinensis	Purple-lipped juga (snail)	1	Deschutes WSR	
Juga newberryi	A Freshwater Snail	1	Lower Deschutes WSR	BLM
Juga sp. 1	Basalt juga (snail)	1		
Juga sp. 4	Opal Springs juga (snail)	1	*Crooked River*	
Juga sp. 6	Purple juga (snail)	1		
Juga sp. 7	Three-band juga (snail)	1		
Monadenia fidelis minor	Oregon snail (Dalles sideband)	1	Lower Deschutes WSR	BLM
Monadenia fidelis ssp. 1	Deschutes sideband (snail)	1		
Oreohelix variabilis	Dalles mountainsnail	1	*Columbia River*	BLM
Oreohelix variabilis ssp. 1	Deschutes mountainsnail	1		
Osmia ashmeadii	A mason bee	1		
Perdita salicis sublaeta	A miner bee	1		
Pristiloma wascoense	Shiny tightcoil (snail)	2		
Pyrgulopsis robusta	Jackson Lake springsnail	2		
Vespericola depressa	Columbia Gorge hesperian (snail)	1		
Vespericola sp. 1	Oak Springs hesperian (snail)	1		
Fish				
Oncorhynchus mykiss pop. 28	Steelhead (Middle Columbia River ESU, summer run)	1	Deschutes WSR, John Day WSR	
Oncorhynchus mykiss pop. 29	Steelhead (Middle Columbia River ESU, winter run)	1	Fifteen Mile Creek WSR	FS

COLUMBIA BASIN SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Oncorhynchus tshawytscha pop. 18	Chinook salmon (Deschutes River ESU, summer/fall run)	1	Deschutes WA, Lower Deschutes River WSR	OFW, BLM
Salvelinus confluentus pop. 18	Bull trout (Deschutes SMU)	1	Deschutes WSR	BLM
Salvelinus confluentus pop. 15	Bull trout (Umatilla SMU)	1		BLM
Amphibians				
Anaxyrus woodhousii	Woodhouse's toad	2		
Lithobates pipiens	Northern leopard frog	2		
Rana luteiventris	Columbia spotted frog	2		
Reptiles				
Chrysemys picta	Painted turtle	2	Columbia Gorge NSA, Irrigon WMA, Umatilla NWR	PVT, OFW
Birds				
Agelaius tricolor	Tricolored blackbird	2	Umatilla NWR	FWS
Ammodramus savannarum	Grasshopper sparrow	2	Boardman RNA,Boardman Grasslands MA,TNC	
Bucephala albeola	Bufflehead	2		
Centrocercus urophasianus	Greater sage-grouse	2		
Falco columbarius	Merlin	2-x		
Falco peregrinus anatum	American peregrine falcon	2		
Melanerpes lewis	Lewis's woodpecker	2	Tygh Valley State Wayside, White River WMA	
Podiceps auritus	Horned grebe	2		
Tympanuchus phasianellus columbianus	Columbian sharp-tailed grouse	2		
Mammals				
Antrozous pallidus	Pallid bat	2		
Brachylagus idahoensis	Pygmy rabbit	2		
Canis lupus	Gray wolf	2		
Corynorhinus townsendii	Townsend's big-eared bat	2		
Euderma maculatum	Spotted bat	2		
Lynx canadensis	Canada lynx	2		
Ovis canadensis nelsoni	Desert bighorn sheep	2-x		
Urocitellus washingtoni	Washington ground squirrel	1	Boardman RNA Boardman Grasslands MA	DOD, TNC

COLUMBIA BASIN SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Vascular Plants				
Achnatherum hendersonii	Henderson ricegrass	1	Lawrence Memorial Grasslands Preserve TNC	TNC, BLM
Allium robinsonii	Robinson's onion	2-x		
Artemisia campestris var. *wormskioldii*	Northern wormwood	1-x	Squally Point Dunes SNA has a re-introduction of this species	
Astragalus collinus var. *laurentii*	Laurence's milk-vetch	1		PVT, DOT
Astragalus geyeri var. *geyeri*	Geyer's milk-vetch	2		
Astragalus hoodianus	Hood River milk-vetch	2	Columbia Gorge NSA	PVT
Astragalus tyghensis	Tygh Valley milk-vetch	1	White River WSR, White River Falls State Park	BLM, PRD
Balsamorhiza rosea	Rosy balsamroot	2		PVT
Callitriche marginata	Winged water-starwort	2		
Carex retrorsa	Retrorse sedge	2		
Cryptantha leucophaea	Gray cryptantha	2-x		
Eremothera pygmaea	Dwarf evening-primrose	1		
Heliotropium curassavicum	Salt heliotrope	2	McNary NWR	FWS
Lipocarpha aristulata	Aristulate lipocarpha	2		
Lomatium watsonii	Watson's desert-parsley	2		
Mimulus evanescens	Disappearing monkeyflower	1		
Myosurus sessilis	Sessile mousetail	1	*Shutler Canyon Playas*	
Penstemon deustus var.*variabilis*	Hot-rock penstemon	1		
Phemeranthus spinescens	Spiny flame-flower	2		
Rorippa columbiae	Columbia cress	1		ACE
Nonvascular Plants				
Aloina bifrons	Moss	2	Boardman RNA and Grasslands Preserve TNC, Hat Rock State Park	TNC, NV PRD
Fungi				
Texosporium sancti-jacobi	Woven-spored lichen	2	Boardman RNA and Grasslands PreserveTNC, Cottonwood Canyon State Park, Lawrence Memorial Grassland Preserve TNC	NV, TNC, PRD

CHAPTER 16. BLUE MOUNTAINS ECOREGION

The Blue Mountains Ecoregion occupies nearly all of northeastern Oregon and extends into small portions of southern Washington and western Idaho. It encompasses three major mountain ranges: the Ochoco, Blue and Wallowa mountains. It also includes the High Lava Plains, an ecoregion recognized in past versions of this plan, which occupies most of the non-forested lands at the western edge of the region.

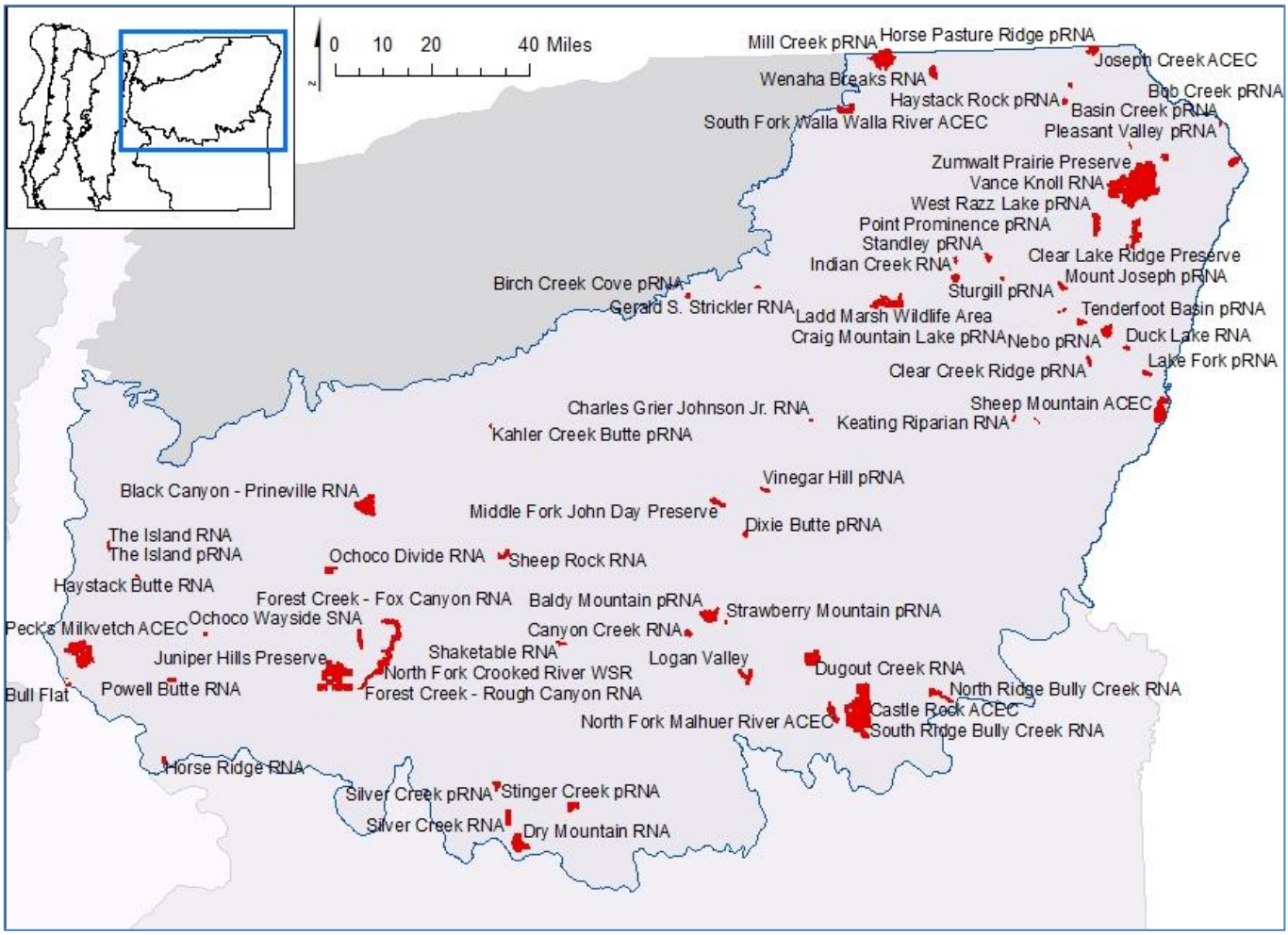


Figure 26. Blue Mountains Ecoregion Natural Areas Map.

Landscapes include deep, rocky-walled canyons, glacially cut gorges, dissected plateaus, broad alluvial river valleys and numerous mountain lakes, forests and meadows. Due to sharp elevational differences, the climate varies over broad temperature and precipitation ranges. Overall, the ecoregion is characterized by short, dry summers and long, cold winters.

The flora is intermediate between the east Cascades and the western Rocky Mountains of Idaho and Montana. Species composition changes with elevation and longitude. Western juniper dominates the western portion of the region, sagebrush and grassland steppes dominate the entire eastern length of the region, ponderosa pine woodlands are characteristic at mid-elevations and mixed coniferous forests dominate at higher altitudes. Extensive grasslands occur in and north of the Wallowa Mountains, while sagebrush steppe is prevalent in the southeastern and southwestern parts of the region.

Before European settlement, Ponderosa pine savannas, basin big sagebrush steppe, native grasslands and riparian woodlands were widespread in this region. Today, many bottomland habitats have been replaced by

irrigated alfalfa, juniper has expanded into many former shrub-steppe vegetation types, and ponderosa pine savannas have been cut or are being invaded by Douglas fir and grand fir.

The diversity in elevation, soils and climate yields diverse habitats and many endemic plant species. The Wallowa Mountains have more than 10 plants species found nowhere else. Bighorn sheep, elk and large mammal populations here are among the largest in the state. The variety in habitats, including low, mid- and high elevation grasslands, shrublands and forests results in this ecoregion having more habitat diversity than all but the Klamath Mountains Ecoregion. As a result, there are a correspondingly high number of ecosystem types.

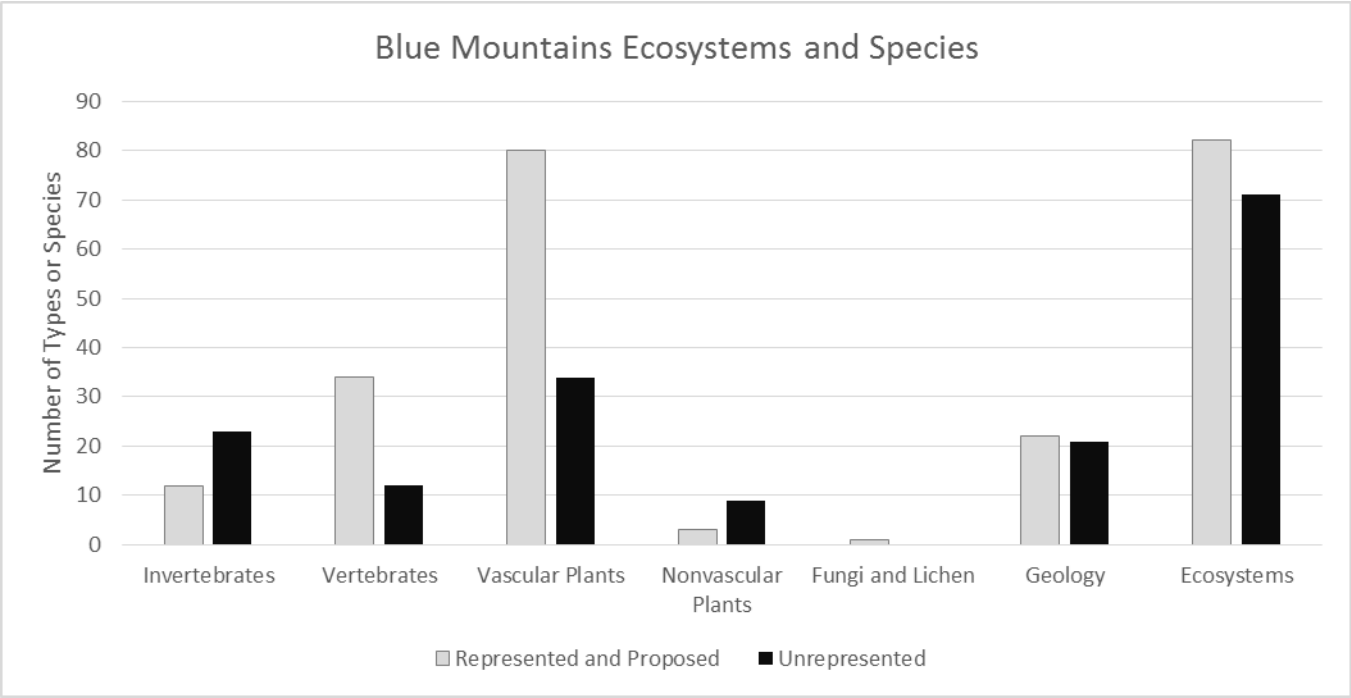


Figure 27. Blue Mountains Ecoregion Represented and Unrepresented Ecosystems and Species.

Forest Analysis

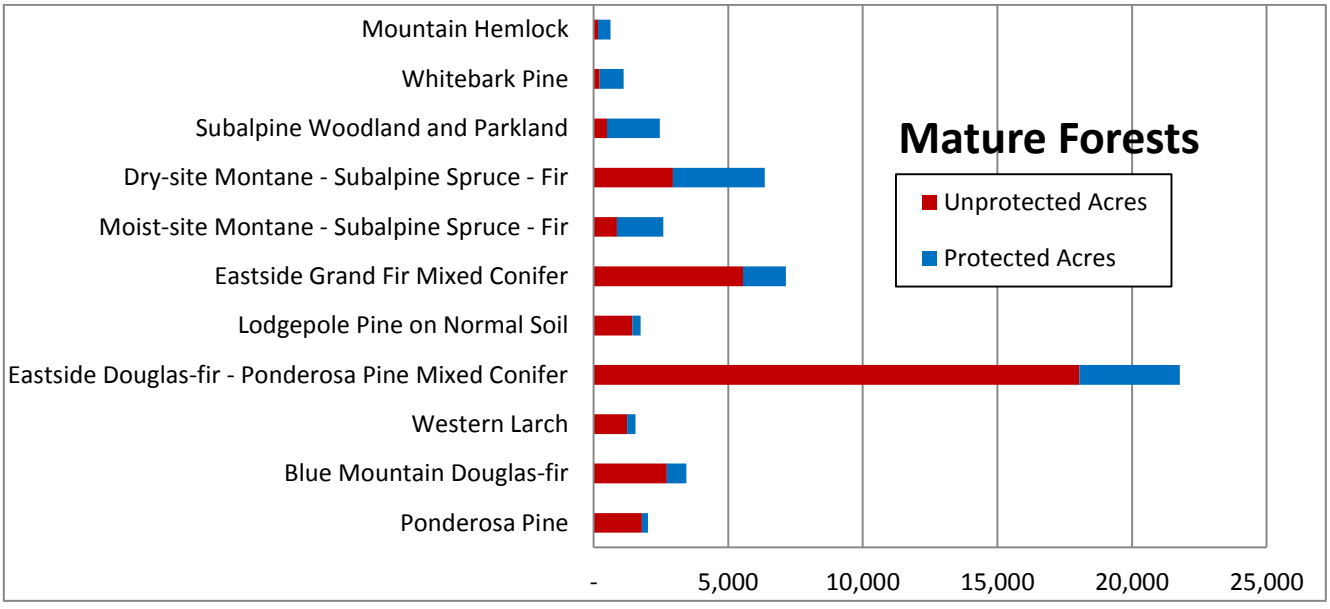


Figure 28. Acreage of protected and unprotected, mature forest types in the Blue Mountains Ecoregion.

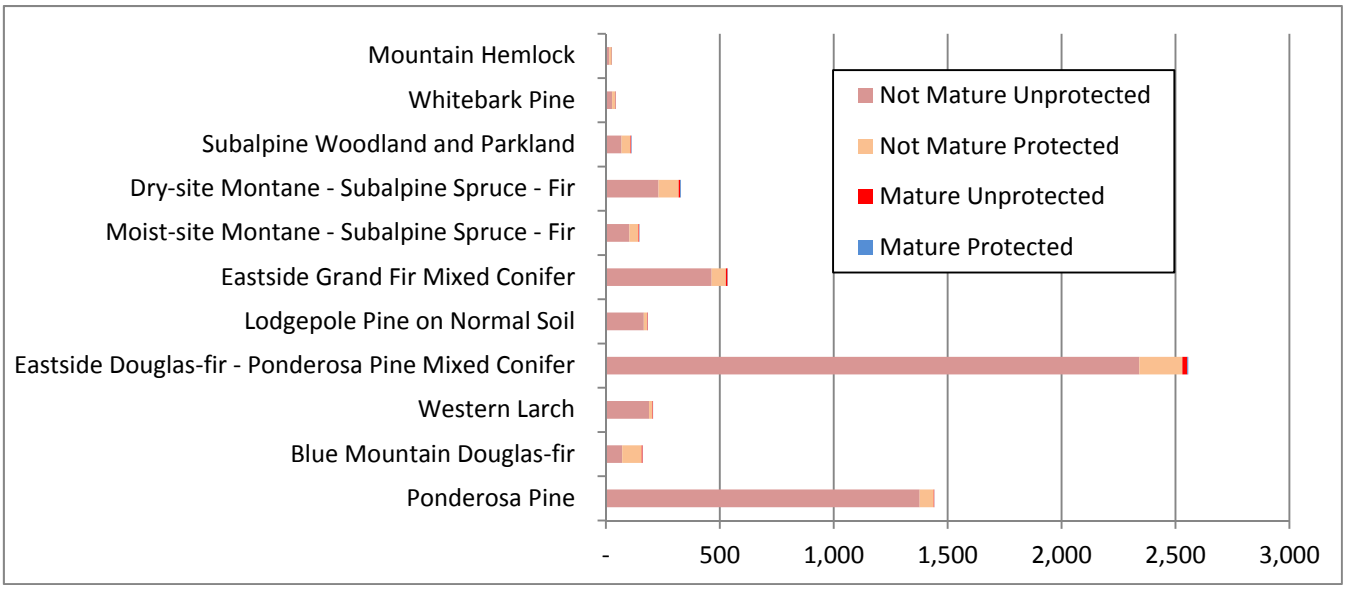


Figure 29. Acres of Forested Ecological Systems in the Blue Mountains, in thousands of acres.

The 2010 plan listed 153 ecosystem types in the Blue Mountains, by far the most of any ecoregion, 55% of which are adequately represented on natural areas. Of the 67 types not adequately represented, only 18 were terrestrial forest types: 5 Ponderosa pine types, 3 Douglas-fir types, 5 grand fir zone types, and 5 located in the subalpine fir zone.

The analysis shows that only about 2% of the Ponderosa pine forests in this ecoregion remain in old forest conditions, but that Ponderosa pine forests are both very common in not mature conditions, and very poorly represented on protected areas in mature conditions. Some of this is likely due to data limitations, as the mature forest data does not identify stands of old Ponderosa pine savannas very well. That being said, the acreage of all Ponderosa pine in protected areas is very low, especially in comparison to the acreage outside of protected areas, so this should clearly be a priority for natural areas designation. There should be opportunities in Hell's Canyon, and if not, in the Eagle Cap close to trailheads, such as the west facing slopes up from Hurricane Creek along the old Twin Creek – Thorp Creek trail.

Other widespread types are the Eastside Douglas-fir – Ponderosa pine Mixed Conifer and the Blue Mountains Douglas-fir, and only 3 of the 7 Douglas-fir types in the plan are represented on RNAs. These should also be a priority. Lodgepole pine has 4 types in the plan, only two which are protected, with natural areas needed for the two lodgepole wetland types. Sites for these should be able to be found.

There is only one type that is completely unrepresented in the plan, remains common in the ecoregion, and still has with significant opportunities (over 15,000 acres) of mature forest remaining: the Western Larch forests. There has to be a number of these, and they should definitely be a priority for establishing new RNAs, before the National Forest plans are finalized.

On the other hand, the 2010 plan has 12 grand fir types included, of which 8 are represented on RNAs. And the plan has 10 subalpine fir-Engelmann spruce types, with only half protected on natural areas. Given how much less important and better protected both of these types are than the Ponderosa pine, Douglas fir, and Western Larch needing protection, perhaps some of these types could be combined; and locations in the wilderness where they are best suited for study be identified.

Agency	Priority		Ecosystem Name	Present Representation
			Western Juniper	
	+	1	Western juniper/low sagebrush/bunchgrass.	Shaketable RNA
FS, BLM	L	2	Western juniper/stiff sagebrush.	*Magpie Table*
FS, BLM	M	3	Western juniper/mountain shrub (bitterbrush, mountain snowberry, serviceberry or squawapple).	*Magpie Table*
	*	4	Western juniper/mountain mahogany.	Baldy Mountain pRNA Canyon Creek RNA
	*	5	Western juniper/big sagebrush/threadleaf sedge.	Horse Ridge RNA
	*	6	Western juniper/big sagebrush/bluebunch wheatgrass.	Sheep Rock RNA Powell Butte RNA The Island RNA
	*	7	Western juniper/big sagebrush/Idaho fescue.	Haystack Butte RNA Powell Butte RNA
	*	8	Western juniper/big sagebrush-bitterbrush/bluebunch wheatgrass & Idaho fescue vegetation.	The Island RNA Dry Mountain RNA
	*	9	Western juniper/big sagebrush-bitterbrush/needle-and-thread.	Badlands ACEC
	*	10	Western juniper/bluebunch wheatgrass.	Sheep Rock RNA Powell Butte RNA
	*	11	Western juniper/Thurber needlegrass on ash.	Sheep Rock RNA *Crooked River Ash Beds*
FS, BLM	H	12	Western juniper/Idaho fescue.	
			Ponderosa Pine	
FS, BLM	M	13	Ponderosa pine-western juniper/big sagebrush-bitterbrush vegetation mosaic.	
FS, PVT	H	14	Ponderosa pine/bluebunch wheatgrass.	
FS	H	15	Ponderosa pine/Idaho fescue.	
	+	16	Ponderosa pine/pinegrass with elk sedge if possible.	Dugout Creek RNA
	+	17	Ponderosa pine/bitterbrush/Ross sedge with elk sedge if possible.	Silver Creek RNA
FS	M	18	Ponderosa pine/mountain snowberry.	*Soldier Creek*
	*	19	Ponderosa pine/mountain mahogany communities with elk sedge & bunchgrasses if possible.	Dry Mountain RNA Stinger Creek pRNA
FS	H	20	Ponderosa pine/common snowberry floodplain.	
			Douglas Fir	
	*	21	Douglas fir/pinegrass.	Canyon Creek RNA, Ochoco Divide RNA, Stinger Creek pRNA
	+	22	Douglas fir/elk sedge.	Government Draw pRNA, Baldy Mountain pRNA

Agency	Priority		Ecosystem Name	Present Representation
FS	M	23	Douglas fir/common snowberry, including riparian type.	*Mill Creek*
	*	24	Douglas fir/mountain snowberry.	Eagle Cap WA
	+	25	Douglas fir/mallow ninebark.	Pleasant Valley pRNA
FS	M	26	Douglas fir/Rocky Mountain maple-mallow ninebark bottomland.	
FS	M	27	Douglas fir/oceanspray.	
			Grand Fir	
		28	Grand fir/beadlily.	
FS	H	29	Grand fir/swordfern-wild ginger with grand fir/oakfern .	*Mill Creek*
FS	M	30	Grand fir/ladyfern.	
	+	31	Grand fir/twinflower forest.	Wenaha Breaks RNA, Birch Creek Cove pRNA
	+	32	Grand fir/pinegrass forest.	Dugout Creek RNA Canyon Creek RNA
	*	33	Grand fir/Columbia brome forest.	Ochoco Divide RNA
	+	34	Grand fir/big huckleberry forest.	Duck Lake RNA, Wenaha Breaks RNA
FS	L	35	Grand fir/grouse huckleberry	
		36	Grand fir/birchleaf spiraea.	Canyon Creek RNA
	+	37	Grand fir/Pacific yew communities.	Wenaha Breaks RNA
		38	Grand fir/common snowberry with grand fir/douglas maple.	Wenaha-Tucannon WA
		39	Grand fir/ninebark with grand fir/douglas maple if possible.	Wenaha-Tucannon WA
FS	H	40	Western larch – mixed conifer forest.	
			Subalpine Fir	
	+	41	Subalpine fir/big huckleberry forest.	Point Prominence pRNA
	*	42	Subalpine fir/grouse huckleberry.	Indian Creek RNA
FS	L	43	Subalpine fir/elk sedge.	
		44	Subalpine fir-Engelmann spruce/beadlily.	Eagle Cap WA
FS	L	45	Subalpine fir-Engelmann spruce/Labrador tea/mixed sedge.	*North Minam Meadows*
		46	Subalpine fir and Engelmann spruce with arrowleaf groundsel or skunk leaved polemonium .	Nebo pRNA
FS	M	47	Subalpine fir/ladyfern or Engelmann spruce/ladyfern.	
FS	M	48	Subalpine fir/bog blueberry/Holms sedge wetland.	*Elkhorn Mountains*
		49	Subalpine fir/Labrador tea/Holms sedge.	Eagle Cap WA
	*	50	Mountain hemlock/grouse huckleberry forest.	Indian Creek RNA

Agency	Priority		Ecosystem Name	Present Representation
	+	51	Subalpine fir-whitebark pine.	Strawberry Mountain pRNA, Sturgill RNA, Nebo pRNA
FS	M	52	Limber pine forest or woodland.	*Slickrock Creek*
			Grassland Communitites	
	+	53	Buckwheat-Sandberg bluegrass complex.	Pleasant Valley pRNA
	+	54	Buckwheat-bluebunch wheatgrass complex.	Lake Fork pRNA
	*	55	Bluebunch wheatgrass-Idaho fescue-silky lupine.	Zumwalt Prairie Preserve TNC, Horsepasture Ridge pRNA
	+	56	Bluebunch wheatgrass-Idaho fescue-arrowleaf balsamroot.	Basin Creek pRNA, Horsepasture Ridge pRNA
	*	57	Bluebunch wheatgrass-Sandberg bluegrass, Balsamroot canyon grassland.	Sheep Rock RNA, Alum Beds pRNA, Haystack Rock pRNA
	+	58	Biscuit scabland grasslands.	Vance Knoll RNA
	*	59	Sandberg bluegrass-onespike oatgrass.	Vance Knoll RNA, Clear Lake Ridge Preserve TNC
	+	60	Snake River grassland canyon mosaic including: sand dropseed, red threeawn, Sandberg bluegrass, prickly pear cactus and bluebunch wheatgrass if possible.	Pleasant Valley pRNA, Bob Creek pRNA, Bills Creek pRNA
	*	61	Idaho fescue-junegrass high elevation and ridgetop communities.	Clear Lake Ridge Preserve TNC
	+	62	Low elevation, Idaho fescue-junegrass.	Basin Creek pRNA, Bob Creek pRNA
			Shrubland Communities	
	*	63	Big sagebrush/Idaho fescue.	Silver Creek RNA, Sheep Rock RNA
	*	64	Big sagebrush/bluebunch wheatgrass.	Dry Mountain RNA, Sheep Rock RNA
DSL, BLM	H	65	Big sagebrush/needle-and-thread community.	
	*	66	Big sagebrush/Thurber needlegrass community.	Black Canyon-Prineville RNA
	+	67	Low sagebrush/Idaho fescue.	Shaketable RNA
	*	68	Low sagebrush/bluebunch wheatgrass.	Sutton Mountain WA
	+	69	Rigid sagebrush/Sandberg bluegrass scabland.	Kahler Creek Butte pRNA Government Draw pRNA Shaketable RNA
	+	70	Netleaf hackberry/bunchgrass canyon shrubland with mockorange-poison ivy terraces or toeslopes.	Pleasant Valley pRNA, Bob Creek pRNA, Alum Beds pRNA
	+	71	Mountain big sagebrush /Idaho fescue.	Vinegar Hill pRNA
	+	72.	Mountain big sagebrush / elk sedge.	Dixie Butte pRNA
FS	M	73	Mountain big sagebrush/Cusick's bluegrass.	

Agency	Priority		Ecosystem Name	Present Representation
	+	74	Smooth sumac/bluebunch wheatgrass.	Bobs Creek pRNA, Alum Beds pRNA
	+	75	Bitterbrush/bunchgrass.	Shaketable RNA
	+	76	Mountain mahogany/bunchgrass.	Pleasant Valley pRNA, Dry Mtn RNA, Baldy Mtn pRNA
PVT, BLM	H	77	Valley margin or bottomland shrubland/grassland with big sagebrush, threetip sagebrush, and bunchgrasses.	
PVT, BLM	L	78	Bitterbrush biscuit scabland.	*Warm Springs*
			Subalpine and Alpine Meadows and Grassland	
	+	79	High elevation Idaho fescue grasslands.	Baldy Mountain pRNA
	+	80	Green fescue-spurred lupine with Parry rush and Hood sedge if possible.	Standley pRNA, Nebo pRNA, Tenderfoot Basin pRNA, Sturgill pRNA, Clear Creek Ridge pRNA
	+	81	Red mountain-heather communities.	Razz Lake pRNA
	+	82	Alpine vegetation mosaic, including fellfields, heaths, and tundra.	Mount Joseph pRNA Eagle Cap WA
	+	83	Alpine sedge communities.	Dixie Butte pRNA
			Special Types	
FS, BLM	L	84	Rocky Mountain juniper shrubland.	*Slickrock Creek*
	*	85	Lodgepole pine/grouse huckleberry/pinegrass.	Indian Creek RNA
	+	86	Lodgepole pine/big huckleberry.	Wenaha Breaks RNA
FS	M	87	Lodgepole pine montane valley wetland with aquatic sedge, bluejoint reedgrass and tufted hairgrass if possible.	
FS	M	88	Lodgepole pine-quaking aspen/Douglas spiraea/forb.	
	+	89	Serpentine vegetation types.	Baldy Mountain pRNA
FS	M	90	Maidenhair fern cobble/boulder bank.	
	*	91	Annual forb communities on exposed ash beds.	Painted Hills NM
			Lacustrine	
BLM	U	92	Low-elevation alkaline lake or pond.	
FS, BLM	U	93	Freshwater lake with aquatic beds and marshy shore.	
	+	94	Mid elevation pond, with aquatic beds and marshy shore.	Wenaha Breaks RNA
PVT, BLM	U	95	Vernal pond on loess or alluvium.	
PVT, BLM	U	96	Pond with aquatic beds and marshy shore.	
PVT, OFW	M	97	Low elevation vernal pond with saltgrass and cordgrass.	*Ladd Marsh*
	+	98	Subalpine pond, with aquatic beds and marshy shore including pondweeds and water lily if possible.	Craig Mountain Lake pRNA

Agency	Priority		Ecosystem Name	Present Representation
	*	99	Mid to high elevation vernal pond.	Indian Creek RNA
	+	100	Mid to high elevation lake, with aquatic beds and marshy shore.	Razz Lake pRNA
	+	101	Alpine pond with quillworts if possible.	Razz Lake pRNA
			Palustrine	
	+	102	Alpine laurel/black sedge and black sedge communities at high elevation.	Craig Mountain Lake pRNA
	*	103	Vernal seepage slopes on tabular basalt, with Cusick camas and California oatgrass.	Hells Canyon WA
FS	M	104	Shrubby cinquefoil/tufted hairgrass.	
	*	105	Seeps on avalanche slopes, with bluebells and nettle.	Eagle Cap WA
	*	106	Sitka alder with ladyfern, and mesic forbs if possible.	Eagle Cap WA
PVT, OFW	U	107	Hot springs.	
	+	108	Bulrush-cattail marsh, with aquatic beds.	Ladd Marsh WMA
	+	109	Forb flush on seepage slope (including marsh marigold, cowparsnip, shooting-star, bistort, tall larkspur, arrowleaf groundsel and false hellebore).	Eagle Cap WA
	*	110	Subalpine sphagnum mire, with floating mat and buckbean.	Duck Lake RNA
	+	111	Subalpine sedge fen, with black and Holm sedge.	Eagle Cap WA
	+	112	Small-fruit bullrush wetland with mannagrass if possible.	Birch Creek Cove pRNA
PVT, FS	M	113	Nebraska sedge meadow.	
PVT, FS	H	114	Cusick bluegrass meadow.	
FS	M	115	Devil's club/mixed forb seeps.	*Sheep Creek*
	*	116	Tufted hairgrass meadow.	Charles Grier Johnson Jr. RNA Elk Flats pRNA
PVT, FS	M	117	Geyer willow shrub swamp.	
FS	M	118	Undergreen willow-mountain willow swamp on organic soils.	
FS	M	119	Booth willow-Geyer willow shrub swamp on organic soils.	
	*	120	Prairie sage levee.	Eagle Cap WA
PVT, BLM OFW	H	121	Alkali playa and wetlands, including creeping wildrye, spikerush, Baltic rush, Nevada bulrush, alkali bluegrass and Lemmon alkaligrass.	
PVT, BLM	M	122	Sedge and rush fen, with grass meadows.	
PVT, BLM	L	123	Bulrush-cattail marsh with aquatic beds.	
BLM	H	124	Great Basin wildrye bottomland.	
BLM	M	125	Silver sagebrush/bunchgrass playa.	
PVT, BLM	M	126	Greasewood/saltgrass with basin wildrye if possible.	

Agency	Priority		Ecosystem Name	Present Representation
			Riparian	
PVT, BLM	H	127	Low elevation riparian dominated by coyote willow, Pacific willow, or arroyo willow.	
FS, BLM	H	128	Red-osier dogwood-mockorange riparian.	Bob Creek pRNA
			Hackberry/bluebunch wheatgrass riparian bench	Bob Creek pRNA
	+	129	Quaking aspen/bluejoint reedgrass forest.	Charles Grier Johnson Jr. RNA
FS	M	130	Quaking aspen/aquatic sedge wetland woodland.	
FS	M	131	Quaking aspen/wooly sedge woodland with wooly sedge meadows if possible.	
	+	132	Quaking aspen/common snowberry forest.	Elk Flats pRNA
	*	133	Mid elevation riparian forest, dominated by birch, mountain alder and mixed conifers.	South Fork Walla-Walla River ACEC, North Fork Crooked River ACEC
	+	134	Western birch-mixed shrub riparian.	Pleasant Valley pRNA, Alum Beds pRNA
	*	135	Mountain alder-redosier dogwood riparian.	Forest Creeks RNA
FS	M	136	Mountain alder/common horsetail riparian with ladyfern or tall mannagrass if possible.	
PVT, FS	M	137	Quaking aspen/mountain alder-snowberry.	
PVT, FS	M	138	Mountain alder-snowberry riparian.	
	*	139	Mountain alder-black hawthorn riparian.	Keating Riparian RNA
PVT, FS	M	140	Tall willow (Booth, Geyer, Lemmon, Bebb, or Missouri willow)/bladder sedge.	
PVT, FS	M	141	Tall willow willow/aquatic sedge.	
PVT, FS	M	142	Tall willow/wooly sedge.	
FS, BLM	M	143	Missouri willow-coyote willow riparian.	
FS, BLM	M	144	White alder/redosier dogwood, snowberry or rose.	
FS, BLM	H	145	White alder/mockorange.	
FS	H	146	White alder-black cottonwood riparian.	
FS	M	147	Black cottonwood/mountain alder-red-osier dogwood.	
FS, BLM	M	148	Black cottonwood/common snowberry.	
PVT, FS	M	149	Black cottonwood/red-osier dogwood.	
PVT, FS	M	150	Black cottonwood/Pacific willow, with coyote willow if possible.	
	*	151	Black cottonwood/black hawthorn.	Joseph Canyon RNA
	+	152	Black cottonwood – quaking aspen.	Birch Creek Cove pRNA
FS	M	153	Quaking aspen-lodgepole pine/Douglas spiraea forb.	

BLUE MOUNTAINS GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Holocene	
BLM	M	1	Landslides	*Hole-in-the-Wall Slide* *Powder and Snake River confluence*
BLM, PVT	M	2	Alder Springs	*Deschutes Canyon* *Deschutes Formation Intersection*
	*	3	Deschutes Canyon	Cove Palisades State Park
	*	4	Hells Canyon Gorge	Hells Canyon NRA – WA
			Pleistocene	
PVT	H	5	Glacial moraines	*Wallowa Lake*
	*	6	Glacial features – Horns, Cirques, Arêtes…	Matterhorn Mountain
	M	7	Entrenched meander	*Grande Ronde River/Perry*
			Miocene	
	*	8	Mascall Formation	Picture Gorge RNA
	*	9	Picture Gorge Basalt	Picture Gorge RNA
	*	10	Grande Ronde Basalt	Hells Canyon WA
	*	11	Imnaha Basalt	Imnaha Canyon - Hells Canyon WA
			Oligocene	
	*	12	John Day Formation	Sheep Rocks Unit - John Day Fossil Beds NM
			Eocene	
	*	13	Clarno Formation	Clarno Unit-John Day Fossil Beds NM
			Cretaceous	
	*	14	Gable Creek Formation	Painted Hills Unit - John Day Fossil Beds NM
	L	15	Hudspeth Shale	*Mitchell*
	L	16	Bernard Formation	*Suplee*
			Jurassic	
	*	17	Coon Hollow Formation	Pittsburg Landing – Hells Canyon NRA
BLM, PVT	L	18	Lonesome Formation	*Suplee*
BLM, PVT	L	19	Trowbridge Formation	*Suplee*
BLM, PVT	L	20	Snowshoe Formation	*Suplee*
BLM, PVT	L	21	Hyde Formation	*Suplee*
BLM, PVT	L	22	Nicely shale	*Suplee*

BLUE MOUNTAINS GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
BLM, PVT	L	23	Suplee Formation	*Suplee*
BLM, PVT	L	24	Robertson Formation	*Suplee*
BLM, PVT	L	25	Weatherby Formation	*Huntington*
FS, PVT	L	26	Keller Creek Shale	*Seneca*
			Jurassic and Triassic	
	L	27	Murder's Creek Graywacke	*Ingle Rock*
	*	28	Hurwal Formation	Hurwal Divide - Eagle Cap WA
			Triassic	
	*	29	Martin Bridge Limestone	Big Bar – Hells Canyon NRA, Matterhorn
	*	30	Doyle Creek Formation	Hells Canyon WA, Cook Creek SR
	*	31	Wild Sheep Creek Formation	Cottonwood Cr. - Hells Canyon WA
	*	32	Laycock Graywacke	Aldrich Mountain SIA
	*	33	Fields Creek Formation	Aldrich Mountain SIA
	*	34	Vester Formation	Aldrich Mountain SIA
BLM	M	35	Huntington Formation	*Huntington*
			Triassic and Permian and Pennsylvanian	
BLM, FS	L	36	Burnt River schist	*Bridgeport*
	*	37	Canyon Mountain Ophiolite	Strawberry Mountains WA
FS	L	38	Elkhorn Ridge Argillite	*Sumpter*
			Permian	
	*	39	Coyote Butte Limestone	Strawberry Mountains WA
	*	40	Hunsaker Creek Formation	Oxbow (Snake River – Hells Canyon NRA)
	*	41	Windy Ridge Formation	Oxbow (Snake River – Hells Canyon NRA)
			Pennsylvanian	
BLM, FS	M	42	Spotted Ridge Formation	*Suplee*
			Mississippian	
BLM, FS	M	43	Coffee Creek Formation	*Suplee*
			Devonian	
BLM, FS	M	44	Fossiliferous Limestone	*Suplee*

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Invertebrates				
Anodonta californiensis	California floater (mussel)	2	Smith Rock State Park	PRD
Ashmeadiella sculleni	A leaf-cutter bee	2		
Boloria bellona	Meadow fritillary (butterfly)	2		FS
Boloria selene	Silver-bordered fritillary (butterfly)	2		BLM
Bombus occidentalis	Western bumblebee	2	Ladd Marsh WMA, Zumwalt Prairie Preserve	OFW TNC
Calliopsis barri	A miner bee	2		
Callophrys johnsoni	Johnson's hairstreak (butterfly)	1		
Cicindela columbica	Columbia River tiger beetle	1-x		
Colias christina pseudochristina	Intermountain sulphur (butterfly)	2		
Colligyrus depressus	Harney Basin duskysnail	1		
Colligyrus sp. 3	Blue Mountains duskysnail	1		
Cryptomastix populi	Poplar oregonian (snail)	1		
Cryptomastix sp. 3	Disc oregonian (snail)	1		
Euphydryas gillettii	Gillett's checkerspot (butterfly)	2		
Fisherola nuttalli	Shortface lanx (Giant Columbia River limpet)		Snake River WSR, Deschutes Canyon WSA	FS BLM
Fluminicola fuscus	Columbia pebblesnail or spire snail	1	Snake River WSR	FS
Gomphus lynnae	Columbia clubtail (dragonfly)	2	John Day River WSR	BLM
Gonidea angulata	Western ridged mussel	2	Snake River WSR, North Fork Umatilla WA	FS
Juga bulbosa	Bulb juga (snail)	1	Deschutes River St. Scenic Waterway	
Juga hemphilli maupinensis	Purple-lipped juga (snail)	1	Deschutes River St. Scenic Waterway	
Juga newberryi	A Freshwater Snail	1	Lower Deschutes River WSR	BLM
Juga sp. 2	Blue Mountains juga (snail)	1		
Juga sp. 4	Opal Springs (Crooked River) juga (snail)	1		
Megomphix lutarius	Umatilla megomphix (snail)	1	North Fork John Day WSR	FS
Monadenia fidelis ssp. 1	Deschutes sideband (snail)	1		
Ochlodes yuma	Yuma skipper (butterfly)	2	*Imnaha River*	
Ogaridiscus subrupicola	Southern tightcoil (snail)	1		
Oreohelix sp. 29	Hells Canyon mountainsnail	1		

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Oreohelix strigosa delicata	Blue mountainsnail	1		
Perdita accepta	A miner bee	1		
Polygyrella polygyrella	Humped coin (snail)	2		
Pristiloma wascoense	Shiny tightcoil (snail)	2		
Radiodiscus abietum	Fir pinwheel (snail)	2		
Scaphinotus mannii	Mann's mollusk-eating ground beetle	2	Grande Ronde River WSR	FS
Taylorconcha insperata	A freshwater snail	1	Snake River WSR	FS
Fish				
Oncorhynchus clarkii lewisi	Westslope cutthroat trout	1	Strawberry Mountain WA, North Fork John Day WA	FS
Oncorhynchus mykiss pop. 13	Steelhead (Snake River ESU)	1	Minam River WSR, Wenaha-Tucannon WA	FS
Oncorhynchus mykiss pop. 28	Steelhead (Middle Columbia River ESU, summer run)	1	John Day WSR, Lower Deschutes River WSR	BLM
Oncorhynchus mykiss pop. 29	Steelhead (Middle Columbia River ESU, winter run)	1		
Oncorhynchus nerka pop. 1	Sockeye salmon (Snake ESU)	1-x		
Oncorhynchus tshawytscha pop. 18	Chinook salmon (Deschutes River ESU, summer/fall run)	1	Lower Deschutes River WSR	BLM
Oncorhynchus tshawytscha pop. 2	Chinook salmon (Snake River ESU, fall run)	1	Hells Canyon NRA	FS
Oncorhynchus tshawytscha pop. 8	Chinook salmon (Snake River ESU, spring/summer run)	1	Eagle Cap WA, Wenaha Tucannon WA	FS
Salvelinus confluentus pop. 13	Bull trout (Malheur SMU)	1	North Fork Malheur River WSR	FS
Salvelinus confluentus pop. 15	Bull trout (Umatilla SMU)	1	North Fork Umatilla River WA	FS
Salvelinus confluentus pop. 18	Bull trout (Deschutes SMU)	1	Lower Deschutes River WSR	BLM
Salvelinus confluentus pop. 19	Bull trout (Grande Ronde SMU)	1	Eagle Cap WA, Wenaha Tucannon WA	FS
Salvelinus confluentus pop. 20	Bull trout (Hells Canyon SMU)	1	North Powder River WSR	FS
Salvelinus confluentus pop. 22	Bull trout (Imnaha SMU)	1	Eagle Cap WA, Imnaha River WSR	FS
Salvelinus confluentus pop. 23	Bull trout (John Day SMU)	1	North Fork John Day WA	FS
Amphibians				
Ascaphus montanus	Rocky Mountain tailed frog	2	Eagle Cap WA, Hells Canyon NRA, Wenaha Tucannon WA	FS
Lithobates pipiens	Northern leopard frog	2		

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Rana luteiventris	Columbia spotted frog	2	Schneider WMA, Starkey Experimental Forest, North Fork John Day WA	OFW FS
Reptiles				
Chrysemys picta	Painted turtle	2	John Day Fossil Beds NM, Ladd Marsh WMA	NPS OFW
Birds				
Agelaius tricolor	Tricolored blackbird	2	John Day Fossil Beds NM	NPS
Ammodramus savannarum	Grasshopper sparrow	2		BLM
Bartramia longicauda	Upland sandpiper	2	Bridge Creek WMA	OFW
Bucephala albeola	Bufflehead	2		
Centrocercus urophasianus	Greater sage-grouse	2	South Ridge Bully Creek RNA	BLM
Coccyzus americanus	Yellow-billed cuckoo	2-x		BLM
Cygnus buccinator	Trumpeter swan	2		
Dolichonyx oryzivorus	Bobolink	2	Ladd Marsh WMA	
Falco peregrinus anatum	American peregrine falcon	2	Eagle Cap WA, Hells Canyon NRA	FS
Histrionicus histrionicus	Harlequin duck	2	Eagle Cap WA, Hilgard Junction State Recreation Area	FS, PRD
Leucosticte tephrocotis wallowa	Wallowa rosy-finch	1	Eagle Cap WA	FS
Melanerpes lewis	Lewis's woodpecker	2	Grande Ronde River State Scenic Waterway, Hells Canyon WA, Ladd Marsh WMA	FS
Parkesia noveboracensis	Northern waterthrush	2		
Picoides albolarvatus	White-headed woodpecker	2		
Podiceps auritus	Horned grebe	2	Clear Lake Ridge Preserve, Eagle Cap WA	TNC FS
Tympanuchus phasianellus columbianus	Columbian sharp-tailed grouse	2	Clear Lake Ridge Preserve	BLM
Mammals				
Antrozous pallidus	Pallid bat	2	John Day Fossil Beds NM	NPS
Brachylagus idahoensis	Pygmy rabbit	2	Sand Hollow WSA	BLM
Canis lupus	Gray wolf	2	Wenaha Tucannon WA	FS
Corynorhinus townsendii	Townsend's big-eared bat	2	Deschutes River State Recreation Area, Hells Canyon NRA, John Day Fossil Beds NM	FS NPS

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Euderma maculatum	Spotted bat	2	Crooked River National Grassland, Hells Canyon NRA, John Day Fossil Beds NM	FS NPS BLM
Gulo gulo	Wolverine	2	Hells Canyon WA, Strawberry Mountain WA, North Fork John Day WA	FS
Lynx canadensis	Canada lynx	2	Eagle Cap WA	FS
Myotis thysanodes	Fringed myotis	2	Hells Canyon NRA, John Day Fossil Beds NM	FS NPS
Ovis canadensis nelsoni	Desert bighorn sheep	2-x		
Pekania pennanti	Fisher	2	Duck Lake RNA, Eagle Cap WA, Hells Canyon NRA, Indian Creek RNA	FS
Ursus arctos horribilis	Grizzly bear	2-x		
Vascular Plants				
Achnatherum hendersonii	Henderson ricegrass	1	Forest Creek-Rough Canyon RNA, North Fork Crooked Creek WSR, North Crooked River ACEC	BLM
Achnatherum wallowaensis	Wallowa ricegrass	1	Clear Lake Ridge Preserve TNC, Zumwalt Prairie Preserve TNC	TNC
Allium dictuon	Blue Mt. onion	1	Wenaha-Tucannon WA	FS
Allium geyeri var. *geyeri*	Geyer's onion	2	Imnaha River WSR	FS
Asplenium viride	Green spleenwort	2	Eagle Cap WA	FS
Astragalus diaphanus var. *diurnus*	South John Day milk-vetch	1	Phillip W. Schneider WMA	OFW
Astragalus misellus var. *misellus*	Pauper milk-vetch	1		
Astragalus peckii	Peck's milk-vetch	1	Bull Flat ACEC, “Innes Market Road” ACEC	BLM
Astragalus tegetarioides	Bastard kentrophyta	1		FS, BLM
Boechera davidsonii	Davidson's rockcress	2	Hunt Mountain ACEC	BLM
Bochera hastatula	Hells Canyon rockcress	1	Eagle Cap WA, Hells Canyon WA	FS
Botrychium ascendens	Upward-lobed moonwort	1	Eagle Cap WA	FS
Botrychium campestre	Prairie moonwort	2	Eagle Cap WA	FS
Botrychium crenulatum	Crenulate grape-fern	1	Eagle Cap WA	FS
Botrychium hesperium	Western moonwort	2	Eagle Cap WA	FS
Botrychium lineare	Skinny moonwort	1	Eagle Cap WA	FS
Botrychium lunaria	Moonwort	2	Eagle Cap WA	FS

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Botrychium montanum	Mountain grape-fern	2	Eagle Cap WA	FS
Botrychium paradoxum	Twin-spike moonwort	1	Eagle Cap WA	FS
Botrychium pedunculosum	Stalked moonwort	1	Eagle Cap WA	FS
Bupleurum americanum	Bupleurum	2	Eagle Cap WA	FS
Calochortus longebarbatus var. *peckii*	Peck's mariposa-lily	1	North Fork Crooked River RNA, Bridge Creek WA	FS
Calochortus macrocarpus var. *maculosus*	Green-band mariposa-lily	1	Wenaha Tucannon WA, Hells Canyon WA	FS
Calyptridium roseum	Rosy pussypaws	2		
Carex atrosquama	Blackened sedge	2	Eagle Cap WA	FS
Carex capillaris	Capillary sedge	2	Eagle Cap WA	FS
Carex concinna	Low northern sedge	2	Eagle Cap WA	FS
Carex cordillerana	Cordilleran sedge	2	Hells Canyon NRA, Wenaha Tucannon WA	FS
Carex duriuscula	Involute-leaved sedge	2-x		
Carex gynocrates	Yellow bog sedge	2	Eagle Cap WA	FS
Carex idahoa	Idaho sedge	1		
Carex lasiocarpa var. *americana*	Slender sedge	2		
Carex media	Intermediate sedge	2	Eagle Cap WA	FS
Carex micropoda	Small-footed sedge	2		
Carex nardina	Spikenard sedge	2	Eagle Cap WA	FS
Carex pelocarpa	A sedge	2	Eagle Cap WA	FS
Carex retrorsa	Retrorse sedge	2		FS
Carex saxatilis	Russet sedge	2	Eagle Cap WA	FS
Carex scirpoidea ssp. *stenochlaena*	Alaskan single-spiked sedge	2	Strawberry Mountain WA	FS
Carex subnigricans	Dark alpine sedge	2	Eagle Cap WA	FS
Carex vernacula	Native sedge	2	Eagle Cap WA	FS
Castilleja chlorotica	Green-tinged paintbrush	1	Horse Ridge RNA	BLM
Castilleja flava var. *rustica*	Rustic paintbrush	2		
Castilleja fraterna	Fraternal paintbrush	1	Eagle Cap WA	FS
Castilleja rubida	Purple alpine paintbrush	1	Eagle Cap WA	FS
Castilleja viscidula	Sticky paintbrush	2	Eagle Cap WA	FS
Caulanthus pilosus	Hairy wild cabbage	2		
Cheilanthes feei	Fee's lipfern	2	Hells Canyon NRA	FS

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Chlorocrambe hastata	Spearhead	1		
Cryptantha grandiflora	Clearwater cryptantha	1		
Cryptantha simulans	Pine woods cryptantha	2		
Cryptogramma stelleri	Steller's rock-brake	2		FS
Cymopterus nivalis	Snowline cymopterus	2	Strawberry Mountain WA	FS
Cyperus lupulinus ssp. *lupulinus*	Great Plains flatsedge	2	Hells Canyon NRA	FS
Cypripedium fasciculatum	Clustered lady's-slipper	2		FS
Elatine brachysperma	Short-seeded waterwort	2		
Eleocharis bolanderi	Bolander's spikerush	2		
Eremothera pygmaea	Dwarf evening-primrose	1	John Day River WSR	BLM
Erigeron. davisii	Engelmann's daisy	2	Hells Canyon NRA	FS
Erigeron disparipilus	White cushion erigeron	2	Hells Canyon NRA, Wenaha Tucannon WA	FS
Eriogonum cusickii	Cusick's eriogonum	1		BLM
Geum rossii var. *turbinatum*	Slender-stemmed avens	2	Eagle Cap WA	FS
Heliotropium curassavicum	Salt heliotrope	2		
Juncus triglumis var. *albescens*	Three-flowered rush	2	Eagle Cap WA	FS
Kobresia bellardii	Bellard's kobresia	2	Eagle Cap WA	FS
Kobresia simpliciuscula	Simple kobresia	2	Eagle Cap WA	FS
Lipocarpha aristulata	Aristulate lipocarpha	2		FS
Listera borealis	Northern twayblade	2	Eagle Cap WA	FS
Lomatium erythrocarpum	Red-fruited lomatium	1	*Cougar Saddle*	FS
Lomatium greenmanii	Greenman's lomatium	1	Eagle Cap WA	FS
Lomatium ochocense	Ochoco lomatium	1	North Fork Crooked River ACEC, North Fork WSA	BLM
Lomatium pastorale	Meadow lomatium	1		
Lomatium tarantuloides		1		FS
Luina serpentina	Colonial luina	1	Strawberry Mountain WA	FS
Lupinus lepidus var. *cusickii*	Cusick's lupine	1	*Denny Flat*	BLM
Lycopodium complanatum	Ground cedar	2		FS
Mimulus evanescens	Disappearing monkeyflower	1		FS
Mimulus hymenophyllus	Membrane-leaved monkeyflower	1	*Horse Creek,* Hells Canyon NRA	FS
Mirabilis macfarlanei	Macfarlane's four-o'clock	1	Pleasant Valley RNA, Hells Canyon WA	FS

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Myosurus sessilis	Sessile mousetail	1		PVT, BLM
Ophioglossum pusillum	Adder's tongue	2		
Packera porteri	Porter's butterweed	2-x	Eagle Cap WA	FS
Pellaea bridgesii	Bridges' cliff-brake	2	Eagle Cap WA	FS
Penstemon deustus var. *variabilis*	Hot-rock penstemon	1	Sutton Mt. WSA	BLM
Penstemon peckii	Peck's penstemon	1	Deschutes Canyon WSA	FS
Phacelia minutissima	Least phacelia	1	Hells Canyon NRA	FS
Phemeranthus spinescens	Spiny flame-flower	2		
Phlox hendersonii	Henderson phlox	2		
Phlox multiflora	Many-flowered phlox	2		BLM, FS
Piptatheropsis exiguum	Little ricegrass	2	Eagle Cap WA	FS
Platanthera obtusata	Small northern bog-orchid	2	Eagle Cap WA	FS
Pleuropogon oregonus	Oregon semaphore grass	1		PVT, DOT
Primula cusickiana	Wallowa primrose	2	Hells Canyon NRA, Eagle Cap WA	FS
Pyrrocoma radiata	Snake River goldenweed	1		
Pyrrocoma scaberula	Rough pyrrocoma	1	Grande Ronde ACEC, Precious Lands WMA	BLM Nez Perce
Rorippa columbiae	Columbia cress	1		
Rubus bartonianus	Bartonberry	1	Hells Canyon WA, Snake River WSR	FS
Salix farriae	Farr's willow	2	Eagle Cap WA	FS
Salix wolfii	Wolf's willow	2	Eagle Cap WA	FS
Saxifraga adscendens ssp. *oregonensis*	Wedge-leaf saxifrage	2	Eagle Cap WA	FS
Silene spaldingii	Spalding's campion	1	Clear Lake Ridge Preserve, Zumwalt Prairie Preserve	TNC
Stanleya confertiflora	Biennial stanleya	1		
Suksdorfia violacea	Violet suksdorfia	2	Minam State Recreation Area	PRD
Swertia perennis	Felwort	2	North Fork John Day WA	FS
Thalictrum alpinum	Alpine meadow-rue	2	Eagle Cap WA	FS
Thelypodium eucosmum	Arrow-leaf thelypody	1	Sutton Mountain WSA	FS
Thelypodium howellii ssp. *howellii*	Howell's thelypody	2		

BLUE MOUNTAINS SPECIAL SPECIES

Species Name	Common Name	List	Present Representation	Agency
Thelypodium howellii ssp. *spectabilis*	Howell's spectacular thelypody	1	*Powder River Easement, Rodeo Grounds Easement*	FWS
Townsendia montana	Mountain townsendia	2	Eagle Cap WA	FS
Townsendia parryi	Parry's townsendia	2	Eagle Cap WA	FS
Trifolium douglasii	Douglas clover	1		FS
Triglochin palustris	Slender bog arrowgrass	2	Strawberry Mountain WA	FS
Trollius laxus ssp. *albiflorus*	American globeflower	2	Hells Canyon NRA, Hells Canyon WA	FS
Utricularia minor	Lesser bladderwort	2		
Nonvascular Plants				
Anastrophyllum minutum	Liverwort	2		
Anthelia julacea	Liverwort	2		
Barbilophozia lycopodioides	Liverwort	2		
Bryum calobryoides	Moss	2		
Harpanthus flotovianus	Liverwort	2	North Fork John Day WA	FS
Jungermannia polaris	Liverwort	2		
Mesoptychia gillmannii	Liverwort	2	North Fork John Day WA	FS
Peltolepis quadrata	Liverwort	2		FS
Preissia quadrata	Liverwort	2	Strawberry Mountain WA	FS
Ptilidium pulcherrimum	Liverwort	2		
Schistidium cinclidodonteum	Moss	2		
Splachnum sphaericum	Moss	1		
Tortula mucronifolia	Moss	2		
Fungi				
Texosporium sancti-jacobi	Woven-spored lichen	2	Crooked River National Grassland, The Island RNA	BLM

CHAPTER 17. NORTHERN BASIN & RANGE ECOREGION

The Northern Basin and Range Ecoregion includes much of southeastern Oregon's high desert and extends south into Nevada and extreme northeastern California. The ecoregion's name reflects its topography and geology, with numerous flat basins separated by isolated, generally north-south mountain ranges. Many of the mountains are fault blocks, with gradual slopes on one side and precipitous basalt rims on the other. In Oregon, elevations range from 2,500 feet in the lowest parts of the Owyhee and Malheur Rivers to more than 9,700 feet on Steens Mountain. Soils are generally rocky and thin, low in organic matter and high in minerals.

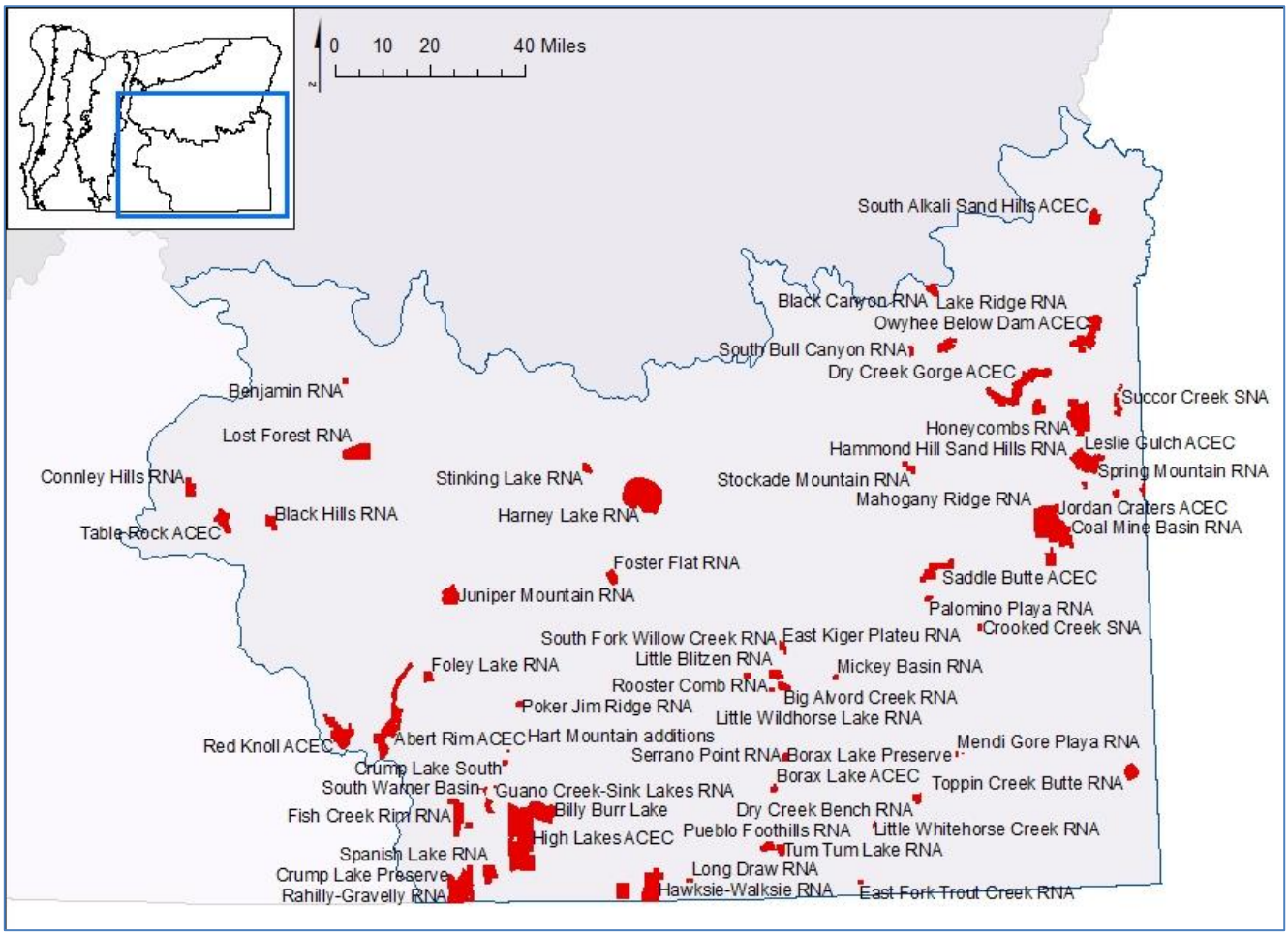


Figure 30. Northern Basin & Range Ecoregion Natural Areas Map.

Another important influence in the ecoregion is the geology, which is mostly of volcanic origin. Over large portions of the landscape, soils have been derived from underlying layers of basalt and rhyolite or occasionally from sedimentary layers that have been exposed by erosion. Of more interest than these "normal soils" are soils derived from volcanic ash and welded tuffs, which are found in distinct sites such as Leslie Gulch and Succor Creek near the Idaho border, or the extensive young lava flows such as Devil's Garden, Diamond Craters, Jordan Craters and Saddle Butte Lava Field. The climate is arid with extreme ranges of daily and seasonal temperatures. Areas in the Alvord Desert (Oregon's driest location) receive as little as 7 inches of rain annually. Runoff from rainfall and mountain snowpack in the basins often flows into flat alkaline playas, forming seasonal shallow lakes and marshes.

Also known as the sagebrush desert or high desert, the Northern Basin and Range Ecoregion contains many diverse habitats. The most significant of these are the extensive sagebrush steppe areas, dominated primarily by Wyoming big sagebrush and low sagebrush, with many small but important silver sagebrush playas. The

ecoregion contains large, closed, alkaline basins, the largest of which is the Alvord Desert. These contain large areas of salt desert scrub characterized by alkaline flats, with Oregon's only populations of Mormon tea, iodine bush, and most of Oregon's winterfat, shadscale and spiny-hopsage alkaline shrublands. The large wildlife refuges, ACECs and Wilderness Areas, support some of the largest populations of pronghorn antelope, white pelicans, sage grouse and waterfowl, and are well known for their wildlife diversity. The refuges and protected areas also contain Oregon's only narrowleaf cottonwood riparian forests, and the majority of the state's alkaline wetlands, mountain mahogany and aspen woodlands.

Included within this section of the plan is a small inclusion of the Snake River Plain ecoregion. This is a major feature in southern Idaho, which extends into Oregon in northeastern Malheur County. It includes the lower Snake River valley from the county line to where the Snake leaves the state, and includes the lower valley of the Malheur River from Ontario to Harper. The Snake River Plain Ecoregion has similar vegetation as the adjacent Northern Basin and Range Ecoregion, but differs markedly in its terrain. The Snake River Plain is basically a broad river valley with low, adjacent foothills.

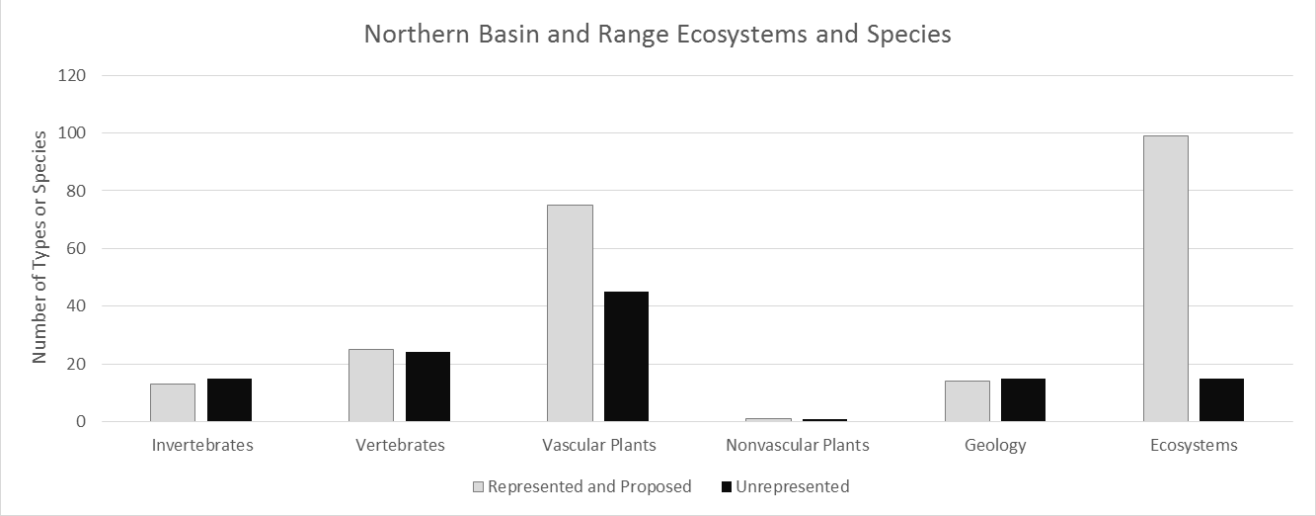


Figure 31. Represented and Unrepresented Ecosystems, Geologic Features and Formations, and Species for the Northern Basin and Range Ecoregion.

Cottonwood Riparian in the Pueblo Foothills RNA. Photo by Elizabeth Crowe

Agency	Priority	Ecosystem Name	Present Representation
		Ponderosa Pine and Western Juniper	
*	1	Ponderosa pine/big sagebrush-bitterbrush, isolated stand within steppe.	Lost Forest RNA
*	2	Ponderosa pine-western juniper/big sagebrush/ needle-and-thread.	Lost Forest RNA
+	3	Ponderosa pine-western juniper/sagebrush-bitterbrush vegetation mosaic.	Castle Rock pRNA Ott Mountain pRNA Sheep Mountain pRNA
*	4	Ponderosa pine-western juniper/low sagebrush vegetation mosaic.	Silver Creek RNA Benjamin RNA
+	5	Western juniper/big sagebrush/bluebunch wheatgrass.	Connley Hills RNA Stockade Mountain RNA Black Canyon – Vale RNA
*	6	Western juniper/big sagebrush/Idaho fescue.	Benjamin RNA
+	7	Western juniper/big sagebrush-bitterbrush.	Rahilly-Gravelly RNA Juniper Gulch pRNA
+	8	Western juniper/bluebunch wheatgrass.	Connley Hills RNA
+	9	Western juniper/Idaho fescue.	Connley Hills RNA Vee Pasture RNA
*	10	Western juniper/low sagebrush/Idaho fescue.	Poker Jim Ridge RNA
+	11	Western juniper-mountain mahogany/mountain big sagebrush/bunchgrass.	Ott Mountain pRNA
*	12	Western juniper/low sagebrush/Sandberg bluegrass.	Poker Jim Ridge RNA
		Mixed Sagebrush and Mountain Big Sagebrush	
*	13	Big sagebrush-greasewood vegetation.	Stinking Lake RNA, Harney Lake RNA
+	14	Big sagebrush-bitterbrush/Idaho fescue.	Fish Creek Rim RNA
+	15	Mountain big sagebrush-bitterbrush-squawapple.	Rahilly-Gravelly RNA
+	16	Snowbrush and bittercherry shrub complex.	Fish Creek Rim RNA
+	17	Big sagebrush-bitterbrush/Idaho fescue.	South Bull Canyon RNA
+	18	Big sagebrush-bitterbrush/Indian ricegrass and big sagebrush/needle and thread mosaic on sandy soils.	Hammond Hill Sand Hills RNA South Alkali Sand Hills pRNA
+	19	Wyoming big sagebrush-squawapple/bluebunch wheatgrass-Thurber needlegrass.	North Ridge Bully Creek RNA
+	20	Wyoming big sagebrush-squawapple/Idaho fescue.	South Ridge Bully Creek RNA
*	21	Mountain big sagebrush/Idaho fescue.	Spring Mountain RNA, Castle Rock pRNA, East Fork Trout Creek RNA
*	22	Mountain big sagebrush/western needlegrass.	Little Blitzen RNA
+	23	Mountain big sagebrush/basin wildrye.	Warner Creek pRNA
+	24	Mountain big sagebrush-mountain snowberry/Idaho fescue.	Spring Mountain RNA

Agency	Priority		Ecosystem Name	Present Representation
	*	25	Mountain big sagebrush, bitterbrush, mountain snowberry/Thurber needlegrass mosaic.	Little Blitzen RNA Rahilly-Gravelly RNA
	+	26	Big sagebrush-threetip sagebrush/bunchgrass.	North Ridge Bully Creek RNA South Ridge Bully Creek RNA
	+	27	Threetip sagebrush/bluebunch wheatgrass.	North Ridge Bully Creek RNA South Ridge Bully Creek RNA
	+	28	Threetip sagebrush/Idaho fescue.	Jordan Crater RNA
	+	29	Silver sagebrush/Nevada bluegrass flat or playa.	Lake Ridge RNA, Toppin Butte RNA, Jordan Crater RNA
			Low and Black Sagebrush	
	+	30	Low sagebrush/bluebunch wheatgrass.	Poker Jim Ridge RNA, Lake Ridge RNA
	+	31	Low sagebrush/Idaho fescue.	Fish Creek Rim RNA, Toppin Butte RNA, Lake Ridge RNA
FWS, BLM	M	32	Low sagebrush/Thurber's needlegrass	*Sagehen Hills*
	*	33	Low sagebrush/Sandberg bluegrass scabland.	Sink Lakes-Guano Creek RNA Stockade Mountain RNA addition
BLM	M	34	Lahontan sagebrush/bunchgrass.	
	+	35	Montane low sagebrush/sheep fescue-Idaho fescue mosaic.	Warner Creek pRNA
BLM	M	36	Early sagebrush/bunchgrass	
	+	37	Black sagebrush/bunchgrass community complex.	Foley Lake RNA, Mendi Gore Playa RNA
	+	38	Rigid sagebrush/bunchgrass (Sandberg bluegrass, bluebunch wheatgrass and/or Idaho fescue.	Black Canyon - Vale RNA
			Big Sagebrush	
	+	39	Wyoming big sagebrush/bluebunch wheatgrass.	Connley Hills RNA Big Alvord Creek RNA
	+	40	Wyoming big sagebrush/Idaho fescue.	Hawksie-Walksie RNA
	*	41	Wyoming big sagebrush/Thurber needlegrass.	North Ridge Bully Creek RNA South Ridge Bully Creek RNA Pueblo Foothills RNA
BLM	H	42	Wyoming big sagebrush/western needlegrass.	
	+	43	Wyoming big sagebrush/needle-and-thread.	Sink Lakes-Guano Creek RNA
	*	44	Wyoming big sagebrush/needle-and-thread on cinders.	Honeycombs RNA
	*	45	Wyoming big sagebrush/Indian ricegrass.	Long Draw RNA
	+	46	Wyoming big sagebrush/Indian ricegrass and Wyoming big sagebrush/needle and thread mosaic.	South Alkali Sand Hills pRNA
	*	47	Basin big sagebrush/bluebunch wheatgrass.	Jordan Crater RNA
PVT, BLM	H	48	Basin big sagebrush/basin wildrye.	*Three Forks pRNA*

Agency	Priority		Ecosystem Name	Present Representation
			Desert or Salt Desert Shrub	
		49	Big sagebrush-spiny hopsage salt desert scrub playa.	Harney Lake RNA Tum Tum Lake RNA
	+	50	Big sagebrush-spiny hopsage-budsage mosaic on ash.	Coal Mine Basin RNA, Basin pACEC, Dry Creek Gorge pACEC
	*	51	Shadscale-spiny hopsage-green mormon tea salt desert scrub.	Pueblo Foothills RNA
	*	52	Black greasewood-shadscale/bunchgrass playa margin vegetation.	Harney Lake RNA Tum Tum Lake RNA
	+	53	Shadscale-budsage/bunchgrass salt desert scrub.	Spanish Lake RNA, Pueblo Foothills RNA
BLM	M	54	Shadscale with open bunchgrass and forbs on tuff or ash.	*Dry Creek Buttes, Leslie Gulch ACEC*
	+	55	Black greasewood flat.	Hammond Hill Sand Hills RNA Crooked Creek SNA
	+	56	Shadscale-big sagebrush mosaic.	Palomino Playa RNA Crooked Creek SNA
	*	57	Winterfat playa.	Mickey Basin RNA Mendi Gore Playa RNA
	*	58	Iodine bush playa.	Tum Tum Lake RNA
	*	59	Davis' pepperweed playa.	Palomina Playa RNA
	*	60	Sand dune series, from active unvegetated dunes through stabilized dunes (with shrubs, Indian ricegrass, and wildrye).	Harney Lake RNA Big Alvord Creek RNA
			Mountain Mahogany	
	+	61	Mountain mahogany/mountain big sagebrush community with bitterbrush if possible.	Fish Creek Rim RNA Mahogany Ridge RNA
	+	62	Mountain mahogany/mountain big sagebrush-snowberry/bunchgrass.	Dry Creek Bench RNA Warner Creek pRNA
	+	63	Mountain mahogany-aspen-cherry snowbank.	Spring Mountain RNA Mahogany Ridge RNA Addition
	*	64	Mountain mahogany/bluebunch wheatgrass canyon.	Rooster Comb RNA
			Special Types	
	+	65	White fir forest.	Hart Canyon pRNA Fir Groves pACEC
	*	66	Aspen/blue wildrye.	Little Blitzen RNA
	*	67	High elevation fescue grassland.	East Kiger Plateau RNA Little Blitzen RNA
	*	68	Alpine upland vegetation including grasslands with alpine oatgrass, sedge and spikerush meadows, and alpine buckwheat.	Little Wildhorse Lake RNA, Little Blitzen RNA, Steens Mountain WA
	*	69	Annual forb communities on exposed ash beds.	Leslie Gulch RNA, Honeycombs RNA

Agency	Priority		Ecosystem Name	Present Representation
			Lacustrine	
	*	70	Low elevation lake with aquatic beds and marshy shore.	Jordan Crater RNA
	*	71	Low elevation hot lake and associated elevated mineral springs.	Borax Lake Preserve TNC Micky Hot Springs pACEC
	*	72	Low elevation alkaline lake.	Harney Lake RNA, Stinking Lake RNA, Tum Tum Lake RNA
	*	73	Mid to high elevation lake.	Little Wildhorse Lake RNA
			Palustrine	
	*	74	Low elevation alkaline pond with aquatic beds and marshy shore.	Harney Lake RNA
	*	75	Freshwater pond with aquatic beds and marshy shore.	Little Wildhorse Lake RNA
	+	76	Low elevation vernal pond.	Sink Lakes-Guano Creek RNA Jordan Crater RNA
	*	77	Mid to high elevation vernal pond.	Little Blitzen RNA
	*	78	Large hot springs.	Borax Lake Preserve TNC Mickey Hot Springs pACEC
	*	79	Running hot springs	Three Forks pRNA, *Harney Hot Springs*
	*	80	Cold springs.	Little Blitzen RNA
	*	81	Bulrush-cattail marsh, with aquatic beds.	Jordan Crater RNA
	+	82	Burreed marsh.	Crump Lake pSNA
	+	83	Reedgrass marsh.	Crump Lake pSNA South Warner Basin Preserve TNC
BLM, FWS	M	84	Nebraska sedge meadow.	
	*	855	Wet sedge meadow in alpine cirque.	Little Blitzen RNA South Fork Willow Creek RNA Little Wildhorse Creek RNA
	*	86	Alkaline marsh, with sedge, spikerush, rush and bulrush.	Harney Lake RNA, Stinking Lake RNA, Borax Lake ACEC/Borax Lake Preserve TNC
	+	87	Silver sagebrush/Great Basin wildrye.	Guano Slough pRNA Sink Lakes-Guano Creek RNA
	*	88	Silver sagebrush/Nevada bluegrass	Foster Flat RNA
	*	89	Silver sagebrush/Nebraska sedge-Cusick bluegrass playa.	Foster Flat RNA
	*	90	Bare playa with playa margin communities, including Baltic rush, Nevada bulrush, alkali bluegrass & Lemmon alkaligrass	Harney Lake RNA Big Alvord Creek RNA
		91	Playa with greasewood and Great Basin wildrye.	Serrano Point RNA

Agency	Priority		Ecosystem Name	Present Representation
	*	92	Greasewood/saltgrass playa.	Harney Lake RNA, Borax Lake ACEC and Preserve TNC, Stinking Lake RNA
	*	93	Greasewood/seablite playa.	Tum Tum Lake RNA Stinking Lake RNA
BLM PRD	H	94	Open basin valley bottom alkaline wetland mosaic, with greasewood/saltgrass and greasewood/Basin wildrye.	*Crooked Creek*
	+	95	Bare playa with Davis' peppergrass.	Palomino Playa RNA Toppin Butte RNA
	+	96	Bare playa with poverty weed.	Spanish Lake RNA
			Riparian	
DSL, BLM	M	97	Intermittent stream dominated by mock orange, bitterbrush or serviceberry.	*Canyon south. of Namorf*
BLM	H	98	Missouri willow/golden currant.	
BLM	H	99	Booth willow-Lemmon willow riparian.	
BLM	H	100	Subalpine willow shrub swamp, with Booth and Drummond willows.	*Fish Creek Meadows*
	*	101	Lemmon willow, mid elevation riparian.	East Fork Trout Creek RNA
BLM	H	102	Low elevation riparian community dominated by coyote willow, Pacific willow and arroyo willow.	
	*	103	Mid elevation riparian community dominated by arroyo willow, red-osier dogwood and Woods rose.	Sink Lakes-Guano Creek RNA
	*	104	Riparian dominated by coyote willow and Pacific willow.	Black Canyon - Vale RNA Three Forks pRNA
BLM, FWS	M	105	Rigid willow/golden currant riparian.	
DSL, BLM	M	106	Geyer willow riparian.	
	+	107	Riparian community dominated by mountain alder and redosier dogwood or snowberry.	Little Whitehorse Exclosure RNA
		108	Quaking aspen - mountain alder riparian.	Little Blitzen RNA
		109	Quaking aspen and scouler willow riparian.	East Fork Trout Creek RNA
		110	Black cottonwood / redosier dogwood riparian.	Little Blitzen RNA, Rooster Comb RNA
	+	111	Black cottonwood / coyote willow riparian.	Big Alvord Creek RNA, Pueblo Foothills RNA
	+	112	Aspen/mountain snowberry woodland or forest with dwarf aspen-bittercherry-serviceberry snowbank communites.	Spring Mountain RNA
	+	113	White alder riparian.	Succor Creek pSNA
DSL, BLM	H	114	Bittercherry-coyote willow-rose riparian.	

NORTHERN BASIN AND RANGE GEOLOGIC FORMATIONS AND FEATURES

Agency	Priority		Formation or Feature Name	Present Representation
			Holocene	
	*	1	Active fault scarp	Abert Rim ACEC
BLM	M	2	Landslides	*Winter Ridge*
	*	3	Eolian dunes	Alvord Dunes ACEC, Warner Lakes Dunes
	*	4	Playa Lakes	Alvord Lake - Alvord ACEC
	*	5	Tyfoni Weathering	Leslie Gulch RNA
BLM	L	6	Pinnacles	*Sand Creek*
			Pleistocene	
	*	7	Cinder cones and craters	Diamond Craters ONA, Jordan Craters RNA
	*	8	Desert deposits and features	Big Alvord Creek RNA
	*	9	Glacial valleys	Steens Mountains WA, Little Blitzen RNA
	*	10	Lake deposits and features	Fort Rock State Park, Harney Lake RNA
BLM	M	11	Landslides	*Rome*
BLM	H	12	Lava Tube Caves	*Saddle Butte*
	*	13	Lava Field	Jordan Craters RNA, Devils Garden ACEC
	*	14	Rhyolite pillars	Leslie Gulch ACEC, Lower Owyhee Gorge
	*	15	Tuff Ring	Fort Rock State Park
			Pliocene	
BLM	L	16	Glenns Ferry Formation	*Malheur Butte*
BLM	L	17	Harney Formation	*Burns*
			Miocene	
PVT	L	18	Rattlesnake Ash-Flow Tuff	*Burns*
	*	19	Jump Creek Rhyolite	Succor Creek State Park
BLM, PVT	L	20	Wildcat Creek Welded Ash-Flow Tuff	*Skull Springs*
BLM	L	21	Rhyolite and Rhyodacite of Dry Creek	*Skull Springs*
BLM	L	22	Prater Creek Ash-Flow Tuff	*Burns*
BLM	L	23	Devine Canyon Ash-Flow Tuff	*Burns*
BLM	L	24	Littlefield Rhyolite	*Namorf*
BLM, PRD	L	25	Owyhee Basalt	*Owyhee River Canyon*
	*	26	Sucker Creek Formation	Succor Creek State Park
	*	27	Steens Mountain Basalt	Steens Mountain WA

Agency	Priority		Formation or Feature Name	Present Representation
BLM	M	28	Pike Creek Volcanics	Steens Mountain Cooperative Management and Protection Area
BLM	M	29	Alvord Creek Formation	

Owyhee River Canyon showing rhyolite, Tyfoni Weathering, and Ash-Flow Tuff

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Invertebrates				
Amerigoniscus malheurensis	Malheur isopod	1	*Malheur Cave*	
Anodonta californiensis	California floater (mussel)	2	Harney Lake RNA, Malheur NWR	FWS
Anodonta nuttalliana	Winged floater	2		
Apochthonius malheuri	Malheur pseudoscorpion	1	*Malheur Cave*	
Ashmeadiella sculleni	A leaf-cutter bee	2		
Calliopsis barri	A miner bee	2		
Colias christina sullivani	Sullivan's sulphur (butterfly)	1	Biscuitroot ACEC, Saddle Butte WSA	BLM
Colligyrus depressus	Harney Basin duskysnail	1		
Fisherola nuttalli	Shortface lanx (=Giant Columbia River limpet)	1	Lower Owyhee Canyon WSA	BLM
Fluminicola insolitus	Donner und Blitzen pebblesnail	1	Donner Und Blitzen WSR	BLM
Fluminicola sp. 9	Malheur pebblesnail	1		
Fluminicola turbiniformis	Turban pebblesnail	1	Hart Mountain National Antelope Refuge	FWS
Gomphus lynnae	Columbia clubtail (dragonfly)	2		
Gonidea angulata	Western ridged mussel	2	Lower Owyhee Canyon WSA, Malheur NWR, Owyhee River Canyon WSA	BLM, FS
Helisoma newberryi newberryi	Great Basin ramshorn (snail)	1		
Kenkia rhynchida	A flatworm (planarian)	1		
Monardella angustifolia	Leslie Gulch Monardella	1		BLM
Ochlodes yuma	Yuma skipper (butterfly)	2		
Oncopodura mala	Malheur Cave springtail	1	*Malheur Cave*	
Petrophysa sp. 1	Hotspring physa (snail)	1	Owyhee River WSR	BLM
Physa megalochlamys	Large-mantle physa (snail)	2		
Planorbella oregonensis	Borax Lake ramshorn (snail)	1	Borax Lake Preserve	TNC
Pyrgulopsis fresti	Owyhee hot springsnail	1	Owyhee River WSR	BLM
Pyrgulopsis intermedia	Crooked Creek springsnail	1	Crooked Creek SNA, Lower Owyhee Canyon WSA	PRD, BLM
Pyrgulopsis owyheensis	A springsnail	1	Owyhee River WSR	BLM
Pyrgulopsis robusta	Jackson Lake springsnail	2	Abert Rim WSA, Owyhee River Canyon WSA	BLM
Stygobromus hubbsi	Malheur Cave amphipod	1	*Malheur Cave*	
Taylorconcha insperata	A freshwater snail	1	Owyhee River Canyon WSA	BLM

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Fish				
Catostomus tahoensis	Tahoe sucker	2		
Catostomus warnerensis	Warner sucker	1		
Gila alvordensis	Alvord chub	1	Borax Lake Preserve	TNC
Gila bicolor eurysoma	Sheldon tui chub	1		
Gila bicolor oregonensis	Oregon Lakes tui chub	1		
Gila bicolor pop. 15	Warner Basin tui chub	1		
Gila bicolor ssp. 1	Hutton tui chub	1		
Gila bicolor ssp. 13	Summer Basin tui chub	1	Summer Lake WA	OFW
Gila bicolor ssp. 2	Catlow tui chub	1	Hart Mountain	FWS
Gila boraxobius	Borax Lake chub	1	Borax Lake Preserve	TNC
Oncorhynchus anaden alvordensis	Alvord cutthroat trout	1-x		
Oncorhynchus anaden henshawi	Lahontan cutthroat trout	2	Steens Mountain RNA, Willow Creek WSA	BLM
Oncorhynchus mykiss pop. 3	Catlow Valley redband trout	1	Hart Mountain	FWS
Oncorhynchus mykiss pop. 4	Warner Valley redband trout	1		
Rhinichthys osculus ssp. 3	Foskett Spring speckled dace	1	*Foskett Springs*	
Richardsonius egregius	Lahontan redside	2		
Salvelinus confluentus pop. 13	Bull trout (Malheur River SMU)	1		
Amphibians				
Anaxyrus woodhousii	Woodhouse's toad	2	Owyhee Breaks WSA	BLM
Lithobates pipiens	Northern leopard frog	2		
Rana luteiventris	Columbia spotted frog	2	Malheur NWR, Steens Mountain Cooperative Management and Protection Area	BLM
Reptiles				
Chrysemys picta	Painted turtle	2	Owyhee WSR	BLM
Birds				
Ammodramus savannarum	Grasshopper sparrow	2		
Anser albifrons elgasi	Tule goose	1		
Bucephala albeola	Bufflehead	2		
Centrocercus urophasianus	Greater sage-grouse	2	Hart Mountain National Antelope Refuge, Jordan Craters RNA, Summer Lake WMA	BLM FWS

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Charadrius nivosus nivosus	Western snowy plover	2	Borax Lake ACEC, Borax Lake Preserve, Harney Lake RNA, Malheur NWR, Summer Lake WA	BLM FWS OFW
Coccyzus americanus	Yellow-billed cuckoo	2-x		
Cygnus buccinator	Trumpeter swan	2	Malheur NWR	
Dolichonyx oryzivorus	Bobolink	2	Malheur NWR	FWS
Egretta thula	Snowy egret	2	Malheur NWR, Summer Lake WMA	FWS OFW
Falco columbarius	Merlin	2-x		
Falco anadensis anatum	American peregrine falcon	2	Fort Rock NA	PRD
Leucophaeus pipixcan	Franklin's gull	2	Malheur NWR	FWS
Leucosticte atrata	Black rosy-finch	2	High Steens WSA	BLM
Melanerpes lewis	Lewis's woodpecker	2		
Pelecanus erythrorhynchos	American white pelican	2	Harney Lake RNA, Jordan Crater RNA, Malheur NWR, Summer Lake WMA	BLM OFW FWS
Podiceps auritus	Horned grebe	2	Malheur NWR	FWS
Tympanuchus phasianellus columbianus	Columbian sharp-tailed grouse	2		
Mammals				
Antrozous pallidus	Pallid bat	2	Hart Mountain National Antelope Refuge, High Steens WSA, Rincon WSA	FWS BLM
Brachylagus idahoensis	Pygmy rabbit	2	Fort Rock NA, Malheur NWR, Hart Mountain National Antelope Refuge, Blitzen River WSA	PRD FWS BLM
Canis lupus	Gray wolf	2		
Corynorhinus townsendii	Townsend's big-eared bat	2	Jordan Crater RNA, Saddle Butte Lava Flow ACEC, High Steens WSA	BLM
Euderma maculatum	Spotted bat	2		
Gulo gulo	Wolverine	2	Little Blitzen RNA, Steens Mountain WA	FS
Lynx canadensis	Canada lynx	2		
Myotis thysanodes	Fringed myotis	2	Cedar Mountain WSA	BLM
Ovis canadensis nelsoni	Desert bighorn sheep	2-x		
Urocitellus elegans nevadensis	Wyoming ground squirrel	2-x		
Ursus arctos horribilis	Grizzly bear	2-x		

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Vulpes macrotis	Kit fox	2	Big Alvord Creek RNA, Saddle Butte Lava Flow ACEC, Pueblo Foothills RNA, Alvord Desert WSA	BLM
Vascular Plants				
Abronia turbinata	Trans montane abronia	2	Big Alvord Creek RNA, Alvord Desert WSA, East Alvord WSA, Mickey Basin RNA	BLM
Agastache cusickii	Cusick's giant-hyssop	2	Pueblo Mountains WSA	
Allenrolfea occidentalis	Iodine bush	2	Malheur NWR, Tum Tum Lake RNA	FWS, BLM
Amsinckia carinata	Malheur Valley fiddleneck	1		
Antirrhinum kingii	King snapdragon	2		
Argemone munita	Prickly-poppy	2		
Artemisia papposa	Owyhee sagebrush	2	Upper West Little Owyhee WSA	BLM
Astragalus calycosus	King's rattleweed	2	Lower Owyhee Canyon WSA	BLM
Astragalus cusickii var. *sterilis*	Sterile milk-vetch	1	Owyhee River WSR, Blue Canyon WSA, Dry Creek Buttes WSA, Dry Creek Gorge ACEC, Dry Creek WSA, Honeycombs RNA, Honeycombs WSA, Leslie Gulch ACEC, Slocum Creek WSA, Upper Leslie Gulch WSA, Wild Horse Basin WSA	BLM
Astragalus geyeri var. *geyeri*	Geyer's milk-vetch	2	Alvord Desert ACEC, Lower Owyhee Canyon WSA	BLM
Astragalus lemmonii	Lemmon's milk-vetch	1		
Astragalus mulfordiae	Mulford's milk-vetch	1	South Alkali ACEC	BLM
Astragalus platytropis	Broad-keeled milk-vetch	2		
Astragalus tegetarioides	Bastard kentrophyta	1		
Astragalus tenellus	Loose flower milk-vetch	2		
Botrychium crenulatum	Crenulate grape-fern	1	Steens Mountain WA	FS
Botrychium lunaria	Moonwort	2	Little Blitzen RNA	
Calyptridium roseum	Rosy pussypaws	2		
Camissonia pusilla	Washoe suncup	2	Long Draw RNA	BLM
Carex atrosquama	Blackened sedge	2	Steens Mountain WA	FS
Carex capitata	Capitate sedge	2	Steens Mountain WA	FS
Carex cordillerana	Cordilleran sedge	2	Steens Mountain WA	BLM
Carex pelocarpa	A sedge	2	Little Blitzen RNA	BLM
Carex saxatilis	Russet sedge	2		

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Carex scirpoidea ssp. *stenochlaena*	Alaskan single-spiked sedge	2	Steens Mountain WA	FS
Carex subnigricans	Dark alpine sedge	2	Little Wildhorse Creek RNA	BLM
Carex tiogana	Tioga Pass sedge	1	South Fork Willow Creek RNA, Steens Mountain WA	BLM
Carex vernacula	Native sedge	2	Steens Mountain WA	FS
Castilleja viscidula	Sticky paintbrush	2	Steens Mountain WA	BLM
Caulanthus crassicaulis var. *glaber*	Smooth wild cabbage	2		
Caulanthus major var. *nevadensis*	Slender wild cabbage	2	Steens Mountain Cooperative Management And Protection Area, Oregon Canyon WSA	BLM
Caulanthus pilosus	Hairy wild cabbage	2		
Chaenactis xantiana	Desert pincushion	2	Steens Mountain WA	FS
Chaetadelpha wheeleri	Wheeler's skeleton-weed	2	Big Alvord Creek RNA	BLM
Collomia renacta	Barren Valley collomia	1	Upper West Little Owyhee WSA	BLM
Cryptantha simulans	Pine woods cryptantha	2		
Cymopterus acaulis var. *greeleyorum*	Greeley's cymopterus	1	Blue Canyon WSA, Lower Owyhee Canyon WSA	BLM
Cymopterus longipes var. *ibapensis*	Ibapah wavewing	2		
Cymopterus nivalis	Snowline cymopterus	2	Little Blitzen RNA	
Cymopterus purpurascens	Purple cymopterus	2	Long Draw RNA	
Dodecatheon pulchellum var. *shoshonense*	Darkthroat shootingstar	2	Crooked Creek NA	PRD
Elatine brachysperma	Short-seeded waterwort	2	Spaulding WSA	BLM
Eleocharis bolanderi	Bolander's spikerush	2	Upper West Little Owyhee WSA	BLM
Eremothera pygmaea	Dwarf evening-primrose	1		
Erigeron latus	Broad fleabane	2	Owyhee River Canyon WSA, Upper West Little Owyhee WSA	BLM
Eriogonum brachyanthum	Short-flowered eriogonum	2		
Eriogonum chrysops	Golden buckwheat	1	*Skull Springs*	
Eriogonum crosbyae var. *crosbyae*	Crosby's buckwheat	1	Basque Hills WSA, Guano Creek-Sink Lakes RNA, *Piute Creek*	BLM
Eriogonum crosbyae var. *mystrium*	Pueblo Mountains buckwheat	1		
Eriogonum cusickii	Cusick's eriogonum	1	Black Hills RNA, Table Rock ACEC	BLM
Eriogonum hookeri	Hooker's wild buckwheat	2	Owyhee Breaks WSA, Leslie Gulch ACEC	BLM

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Eriogonum prociduum	Prostrate buckwheat	1	Hart Mountain National Antelope Refuge	FWS
Eriogonum salicornioides	Playa buckwheat	2	Crooked Creek NA, Owyhee Breaks WSA, Succor Creek NA	PRD, BLM
Galium serpenticum ssp. *warnerense*	Warner Mountain bedstraw	1	Table Rock ACEC, Black Hills RNA	BLM
Gentiana prostrata	Moss gentian	2	South Fork Willow Creek RNA, Steens Mountain WA	BLM, FS
Gentianella tenella ssp. *tenella*	Slender gentian	2	South Fork Willow Creek RNA	BLM
Gratiola heterosepala	Boggs Lake hedge-hyssop	1		BLM
Hackelia cronquistii	Cronquist stickseed	1		BLM
Hackelia ophiobia	Three Forks stickseed	2	North Fork Owyhee WSR	
Heliotropium curassavicum	Salt heliotrope	2	Lost Forest/Sand Dunes/Fossil Lake ACEC/RNA, Sand Dunes WSA, Tum Tum Lake RNA, Warner Wetlands ACEC	BLM
Hymenoxys cooperi var. *canescens*	Cooper's goldflower	2	Rahilly-Gravelly RNA	BLM
Ivesia rhypara var. *rhypara*	Grimy ivesia	1	Leslie Gulch RNA	BLM
Ivesia rhypara var. *shellyi*	Shelly's ivesia	1	*Venator Canyon*	BLM, DSL
Ivesia shockleyi	Shockley's ivesia	2	West Little Owyhee River WSR	BLM
Juncus bryoides	Mosslike dwarf rush	2		
Juncus tiehmii	Tiehm's rush	2		
Kobresia bellardii	Bellard's kobresia	2	Steens Mountain WA	BLM
Lepidium davisii	Davis' peppergrass	1	Palomino Playa RNA	BLM
Lepidium dictyotum	Alkali peppergrass	2		
Lipocarpha aristulata	Aristulate lipocarpha	2		
Lomatium bentonitum	Bentonite biscuitroot	1		
Lomatium foeniculaceum var. *fimbriatum*	Fringed desert-parsley	2		
Lomatium roseanum	Rose's lomatium	1		
Lupinus nevadensis	Nevada lupine	2	Alvord Peak ACEC, Steens Mountain WA	BLM
Malacothrix sonchoides	Sow-thistle desert-dandelion	2	Alvord Desert WSA, Lower Owyhee Canyon WSA, Table Mountain WSA	BLM
Melica stricta	Nodding melic	2	Hart Mountain National Antelope Refuge	
Mentzelia congesta	United blazingstar	2		
Mentzelia mollis	Smooth mentzelia	1	Coal Mine Basin RNA	BLM

NORTHERN BASIN AND RANGE SPECIAL SPECIES

Scientific Name	Common Name	List	Present Representation	Agency
Mentzelia packardiae	Packard's mentzelia	1	Leslie Gulch RNA	BLM
Mimulus evanescens	Disappearing monkeyflower	1	*Anderson Crossing*	BLM, PVT
Mimulus latidens	Broad-toothed monkeyflower	2		BLM, PVT
Mimulus tricolor	Three-colored monkeyflower	2		
Mirabilis laevis var. *retrorsa*	Bigelow's four-o'clock	2	Big Alvord Creek RNA, Borax Lake ACEC	BLM
Muhlenbergia minutissima	Annual dropseed	2	Jordan Crater RNA	BLM
Oxytropis sericea var. *sericea*	White locoweed	2		
Pappostipa speciosa	Desert needlegrass	2	Steens Mt WA, Steens Mt WSA, Winter Range WSA	BLM
Penstemon deustus var. *variabilis*	Hot-rock penstemon	1	Succor Creek State NA	PRD
Penstemon perpulcher	Beautiful penstemon	1		
Phacelia inundata	Playa phacelia	1	Warner Potholes ACEC, Silver Lake RNA	BLM
Phacelia lutea var. calva	Yellow scorpionweed	2		BLM
Phacelia lutea var. *mackenzieorum*	Mackenzie's phacelia	1	Leslie Gulch RNA	BLM
Phemeranthus spinescens	Spiny flame-flower	2		
Physaria chambersii	Chambers' bladder-pod	2	Leslie Gulch ACEC, Lower Owyhee Canyon WSA	BLM
Pilularia americana	American pillwort	2	*South of Hampton*	
Plagiobothrys salsus	Desert allocarya	2	Lake Abert ACEC	BLM
Pleuropogon oregonus	Oregon semaphore grass	1		
Pogogyne floribunda	Profuse-flowered pogogyne	1	Foley Lake RNA	
Potamogeton diversifolius	Rafinesque's pondweed	2	Steens Mountain Cooperative Management and Protection Area	BLM
Potamogeton fibrillosus	Fibrous pondweed	2-x	Malheur NWR	FWS
Prenanthella exigua	Desert prenanthella	2	Lower Owyhee Canyon WSA	BLM
Primula cusickiana	Wallowa primrose	2	Upper West Little Owyhee WSA	BLM
Pyrrocoma radiata	Snake River goldenweed	1		
Rafinesquia californica	California chicory	2		
Rorippa columbiae	Columbia cress	1	Diable Mt WSA, *Malheur Lake Exclosures*	BLM
Rotala ramosior	Toothcup	2	Diamond Craters ONA/ACEC	BLM
Saxifraga adscendens ssp. *oregonensis*	Wedge-leaf saxifrage	2	Little Blitzen RNA	BLM
Senecio ertterae	Ertter's senecio	1	Leslie Gulch RNA	BLM

Scientific Name	Common Name	List	Present Representation	Agency
Sesuvium verrucosum	Verrucose sea-purslane	2	Hart Mountain National Antelope Refuge, Tum Tum Lake RNA	FWS, BLM
Stanleya confertiflora	Biennial stanleya	1		
Stephanomeria malheurensis	Malheur wire-lettuce	1	South Narrows ACEC	BLM
Stuckenia striata	Nevada pondweed	2	North Fork Owyhee River WSR, Owyhee River WSR	BLM
Stylocline psilocarphoides	Malheur stylocline	2-x		
Swertia perennis	Felwort	2	South Fork Willow Creek RNA	BLM
Symphoricarpos longiflorus	Long-flowered snowberry	2	Hart Mountain National Antelope Refuge, Whitehorse Basin ACEC	FWS, BLM
Thelypodium brachycarpum	Short-podded thelypody	2	Summer Lake WMA	OFW
Thelypodium howellii ssp. *howellii*	Howell's thelypody	2		
Townsendia scapigera	Tufted townsend daisy	2		
Trifolium leibergii	Leiberg's clover	1	Riverside WMA, *Drewsey*	OFW
Trifolium owyheense	Owyhee clover	1	Leslie Gulch RNA, Honeycombs RNA	BLM
Utricularia minor	Lesser bladderwort	2		
Nonvascular Plants				
Ephemerum crassinervium	Moss	2		
Tortula mucronifolia	Moss	2	Steens Mountain WA	FS

Eriogonum chrysops (golden buckwheat) at Skull Springs. Photo by Jim Reveal.

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Snowy plover (*Charadrius alexandrinus nivosus*), Adam Kotaich photo

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APPENDIX 1. FORMS AND PROCEDURES USED IN THE NATURAL AREA PROGRAM

Comparative Analysis Format for Natural Area Designation

A. Introduction and Methods

B. Abstract of Each Site

1) Site Description - Brief descriptive sentences about the vegetation or species at the site, its relationship to the landscape and geomorphology.
2) List of the target and secondary ecosystem types or species present at the site and brief description as to the: (a) size, (b) quantity, (c) quality and (d) natural variation represented for each.
3) Legal Considerations
    a) Preserve Boundaries - Description of boundaries for entire proposed area.
    b) Tract Ownership Summary - Names and addresses of owners or managers and legal description of property.
    c) Protection Costs - Costs of buying, if privately owned, or taking out of production, if currently used or designated for commodity use. Includes property values (assessed and real, if applicable).
    d) Stewardship Costs - Costs of executing any necessary management recommendations, e.g. fencing, burning, etc. Briefly states management needs.

C. Comparison of Sites

1) Physical Attributes - Size, aspects, soil, scenic qualities, etc.
2) Ecological Attributes - Quality in terms of species composition, absence of invaders, lack of sign of physical disturbance, general vigor, presence of indicator species (for communities), viability (for species).
3) Overall Attributes - Costs and ease of actual protection.
4) Tabular Summary of Ranking Considerations.

Model Dedication Agreement Form for State Natural Areas

The Oregon Parks and Recreation Commission and the [name of agency] hereby agree to the following provisions as they pertain to [name of site] located at [legal description of site location]. By virtue of this agreement, the above-described site is dedicated as a Natural Area as provided for in the Oregon Natural Areas Act, as amended.

This agreement is entered into for the purpose of promoting natural diversity of native species and ecosystems in Oregon, and specifically to protect the designated area as a representative site for the [name of ecosystem, or geologic type(s) or species)] as identified in the Oregon Natural Areas Plan of [date].

This agreement includes as additional instruments of dedication the appended documents as follows:
(a) A statement of management objectives for the site;
(b) The Natural Heritage Registry Summary Form for the site;
(c) Any other documents as needed.

Either party to this agreement may terminate it in accordance with the provisions of the Oregon Natural Areas Act upon 60 days written notice, including specific reasons for termination.

Approved and signed on [date]. Signatures.

Model Procedures for State Agency Dedication of Natural Areas

Model dedication procedures are included to assist natural resource state agencies in establishing natural areas on their lands. Agencies may wish to further refine these guidelines.

Oregon's Natural Areas Program has rules in force for dedicating and managing such areas (Oregon Administrative Rules 141-50-500 to 141-50-599). The procedures recommended here are designed to keep the process as simple as possible in conformity with these existing rules.

Step 1: Agency Receives Dedication Proposal from Natural Area Program Staff at OPRD or ORBIC.

A letter from staff to the agency includes reasons why the site is proposed for dedication, a general description of the site and its boundaries, and management considerations.

Step 2: Agency Evaluates Dedication Proposal

1) Within one month, the agency designates the person responsible for evaluating the proposal and preparing the dedication documents and communicates this information informally or in writing to OPRD or ORBIC.
2) Using staff or consultants and consulting with the OPRD or ORBIC staff, the agency evaluates the proposal to determine whether or not it is feasible.
3) The agency takes into account the Natural Area Program rules (referenced above), recognizing that the council is empowered to waive any of its own rules which would prevent dedication of a natural area due to conflict with agency statutes, rules, regulations, or policy.
4) The agency determines within six months after receiving the council proposal whether or not to go forward with dedication procedures for that site, and communicates this decision to the council in writing. The council recognizes that evaluations that depend on seasonal opportunities for study may take longer.

Step 3: Agency Draft Dedication Documents

The agency, in consultation with OPRD or ORBIC staff, drafts two dedication documents. One is a dedication agreement specifying the boundaries of the site, the natural heritage values the agreement is designed to protect, and any other considerations as needed.

The other document is a statement of management objectives for the site. This outlines major known threats to the resources in question, as well as the best and most realistic methods of protecting them. It includes activities to be encouraged, allowed or proscribed, and options for management agreements involving outside parties.

Additional documents to accompany the dedication agreement may also on occasion be required to meet the needs of the agency, the council, the State Land Board, or other parties.

Step 4: Public Notice, Hearing, and Agency Approval

The agency, according to its existing rules and procedures for public notice and hearing, publishes notice of intent to dedicate the site and places the matter on the agenda of the regular public meeting of the board or commission which oversees the agency. The meeting or meetings at which the dedication proposal is discussed and approved constitute the required public hearing.

After taking into account any public comment, the board or commission revises the dedication documents as needed and accords them final approval.

Step 5: Dedication by Oregon Parks and Recreation Commission

The agency, OPRD and ORBIC staff together bring the dedication agreement and accompanying documents before a regular Oregon Parks and Recreation Commission meeting for approval.

Step 6: Dedication Ceremony

This step is optional, and can include whatever ceremony and activities the agency and the council believe are appropriate.

Summary Form for Sites included in the Register of Natural Heritage Resources

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OREGON REGISTER OF NATURAL HERITAGE RESOURCES
SUMMARY FORM

1. NATURAL AREA NAME:
2. LOCATION:
3. SIZE:
4. REGISTER CATEGORY:
5. PRINCIPAL ECOSYSTEM OR GEOLOGIC TYPES:
6. SPECIAL SPECIES:
7. EVALUATION OF CRITERIA FOR REGISTRATION
    - A. PRIORITY IN PLAN:
    - B. ADEQUATE REPRESENTATION:
    - C. DEGREE OF DISTURBANCE:
    - D. VIABILITY:
    - E. UNIQUE GEOLOGICAL VALUES:
    - F. PRIORITY FOR SPECIAL SPECIES:
    - G. SPECIAL SPECIES PROTECTION CAPABILITY:
    - H. MANAGEABILITY:
8. SPECIAL REMARKS OR COMMENTS:
9. OWNERSHIP:
10. CONSENT OF OWNER (PRIVATE), DATE:
11. DATE OF STAFF RECOMMENDATION:
12. DATE OF COMMISSION APPROVAL:
13. SOURCES OF ADDITIONAL INFORMATION:
14. VALUE OF NATURAL AREA IN LAY TERMS:

APPENDIX 2. OREGON STATE REGISTER OF NATURAL HERITAGE RESOURCES AS OF 30 JUNE 2015

Name (Owner) – Year Registered

Ace Williams Mountain (BLM) - 2001
Ainsworth (OPRD) - 1993
Bald Hill (City of Corvallis) - 1991
Bandon Marsh (USFWS) - 2002
Beaver Creek (OPRD) – 2009
Benson Addition, Multnomah Falls (OPRD) - 1991
Billy Burr Lake (USFWS) - 1993
Blacklock Point (OPRD) - 1988
Blind Slough Swamp Preserve (TNC) - 1995
Blowout Ponds (OPRD) - 1993
Borax Lake Preserve (TNC) - 1994
Bridal Veil Falls (OPRD) - 1993
Bull Flat (DSL) - 1990
Camassia Preserve (TNC) - 2003
Cape Arago Marine Gardens (OPRD) - 1992
Cape Blanco (OPRD) – dedicated in 1991
Cape Ferrelo (OPRD) - 1999
Cape Lookout (OPRD) - 1988
Cape Meares (OPRD) – dedicated in 1988
Cape Sebastian (OPRD) - 1999
Carl Washburn Blowout Ponds (OPRD) - 1993
Cascade Head Preserve (TNC) - dedicated in 1985
Clear Lake Ridge Preserve (TNC) - 1989
Coburg Ridge Preserve (TNC) – 2008
Collier State Park (OPRD) - 1992
Columbia Oaks (Hood River Co, OPRD) - 1993
Conley Lake (ODFW) - 1999
Coopey Falls (OPRD) - 1993
Crissey Field (OPRD) - 1999
Crooked Creek (OPRD) - 1991
Crook Point (USFWS) -1998
Crump Lake Preserve (TNC) - 1993
Crump Lake South (DSL) - 1990
Davis Slough (DSL) - 1989
Denman Vernal Pools (ODFW) - 1994
Eight Dollar Mountain (OPRD, TNC) - 1988
Elowah Falls (OPRD) - 1993
Flagg Island (ODOT) - 1993
Gary & Chatham Islands (Multnomah Co) - 1992
Givan Park (Jackson Co.) - 1993
Hart Mountain additions (USFWS) – 1991, 1994
Humbug Mountain (OPRD) - 1999
Illinois River Forks (OPRD) - 1997
Indian Sands (OPRD) - 1991
Jackson-Frazier Wetlands (Benton County) - 1991
Juniper Hills Preserve (TNC) - 1998

Name (Owner) – Year Registered

Kingston Prairie Preserve (TNC) - 1997
Knappa Slough Island (DSL) - 1999
Ladd Marsh (ODFW) – 1988, 2004
Latourell Falls (OPRD) - 1993
Lindsay Prairie Preserve (TNC) - 1988
Little North Santiam River (FS) - 1991
Little Rock Island and Shore (PRD) - 1988
Logan Valley (Burns Paiute Tribe) - 1999
Luckiamute Landing (OPRD) - 1993
Memaloose (OPRD) - 1993
Middle Fork John Day River Preserve - Dunston (TNC) - 1990
Middle Fork John Day River Preserve - Oxbow (TNC) - 1999
Mill Creek Ridge (BLM) - 1991 & (CLT) 2014
Miller Island (ODFW) - 1992
Multnomah Falls (OPRD, FS) - 1991
Nehalem Bay (OPRD) - 1991
Nesika Beach Preserve (TNC) -1998
Nestucca Bay (DSL) - 1994
Netarts Spit (OPRD) – dedicated in 1989
North Fork Owyhee River (BLM) - 2004
Ochoco State Wayside (OPRD) - 1990
Onion Peak Preserve (DSL, ODF, NCLC) – dedicated in 1988
Ophir Dunes (ODOT) - 1988
Otter Point (OPRD) – 1999
Piute Creek (DSL) - 1992
Pumpkin Ridge (Private - GROWISER) - 1994
Rattlesnake Butte (CTGR) - 1986
Rooster Rock (OPRD) – 1990
Rough and Ready Creek Preserve (TNC) - 1994
Rough and Ready State Wayside (OPRD) - 1989
Round Top Butte Preserve (TNC) - 1986
Rowena Plateau (OPRD) - 1993
Saddle Mountain (OPRD) – dedicated in 2005
Scappoose Bay (OPRD) -1999
Simpson Reef – Cape Arago (DSL) - 1992
Skull & Little Wallace Island (DSL) - 1991
Smith Island (DSL) - 1989
Snag Boat Bend (USFWS) - 1999
South Grouse Gap (FS) - 1998
South Slough (DSL) - 1991
Succor Creek (PRD) – 1988
Squally Point Dunes (OPRD) - 1993

Starvation Creek and Warren Creek (OPRD, FS) - 1990
Steens Mountain – Ankle Creek (BLM) - 2001
Steens Summit (DSL) - dedicated 1979
Succor Creek (OPRD) - 1988
Sycan Marsh Preserve (TNC) – 1988, 2013
Table Rocks (TNC, BLM) – 1986, 2008
Tillamook Bay Preserve (TNC) - 2011
Tom McCall Preserve at Rowena (TNC) - 1986
Twin Rocks Bluffs (OPRD) - 1999
Tygh Valley (OPRD) - 1991
Umpqua Lighthouse (OPRD) – 2002
Upper Klamath Lake (USFWS) - 2013
Wallace and Anunde Islands (USFWS) – 1993
Westport Slough (USFWS) - 1991
West Sand Island (COE) - 1988
Whalen Island (OPRD) - 2001
Whetstone Savanna Preserve (TNC) - 1995
Willamette Confluence Preserve (TNC) – 2010
Willamina Oaks (TNC) – 2014, 2015
Williamson River Delta Preserve (TNC) – 1997, 2007
Willow Creek Preserve (TNC) - 1998
Winchuck Slope (DSL) - dedicated 1979
Woodcock Creek (DSL) - 1990
Yamhill Oaks Preserve (TNC) – 2009, 2013
Zumwalt Prairie Preserve (TNC) – 2001, 2006

CLT – Columbia Land Trust TNC – The Nature Conservancy TWC – The Wetlands Conservancy
ODF – Department of Forestry ODFW – Department of Fish and Wildlife DSL – Department of State Lands
ODOT – Department of Transportation CTGR – Confederated Tribes of the Grand Ronde
OPRD – Parks and Recreation Department

Ponderosa pine (*Pinus ponderosa*) savanna at Round Top Butte RNA. Photo by Jimmy Kagan.

APPENDIX 2A. OREGON'S NATURAL AREAS

Natural Area Name	Ecoregion	Ownership	Area (acres)
Baldy Mountain pRNA	BM	FS	3859
Basin Creek pRNA	BM	FS	754
Birch Creek Cove pRNA	BM	FS	411
Black Canyon - Prineville RNA	BM	BLM	6639
Bob Creek pRNA	BM	FS	183
Bull Flat pSNA	BM	DSL	256
Canyon Creek RNA	BM	FS	741
Castle Rock ACEC	BM	BLM	22803
Charles Grier Johnson Jr. RNA	BM	FS	131
Clear Creek Ridge pRNA	BM	FS	662
Clear Lake Ridge Preserve	BM	TNC	3464
Craig Mountain Lake pRNA	BM	FS	172
Dixie Butte pRNA	BM	FS	335
Dry Mountain RNA	BM	BLM/FS	4400
Duck Lake RNA	BM	FS	312
Dugout Creek RNA	BM	FS	4991
Forest Creek - Fox Canyon RNA	BM	BLM	131
Forest Creek - Rough Canyon RNA	BM	BLM	239
Gerald S. Strickler RNA	BM	FS	195
Haystack Butte RNA	BM	FS	74
Haystack Rock pRNA	BM	FS	425
Horse Pasture Ridge pRNA	BM	FS	338
Horse Ridge RNA	BM	BLM	609
Indian Creek RNA	BM	FS	1003
Joseph Creek ACEC	BM	BLM	1374
Juniper Hills Preserve	BM	TNC	14045
Kahler Creek Butte pRNA	BM	FS	84
Keating Riparian RNA	BM	BLM	206
Ladd Marsh Wildlife Area	BM	OFW	5465
Lake Fork pRNA	BM	FS	660
Logan Valley	BM	Burns Paiute Tribe	1769
Middle Fork John Day Preserve	BM	TNC	1269
Mill Creek pRNA	BM	FS	7491
Mount Joseph pRNA	BM	FS	705
Nebo pRNA	BM	FS	2340
North Fork Crooked River WSR	BM	BLM	10778
North Fork Malhuer River ACEC	BM	BLM	1811
North Ridge Bully Creek RNA	BM	BLM	1568
Ochoco Divide RNA	BM	FS	1906
Ochoco Wayside SNA	BM	PRD	174

Natural Area Name	Ecoregion	Ownership	Area (acres)
Peck's Milkvetch ACEC	BM	BLM	10081
Pleasant Valley pRNA	BM	FS	1492
Point Prominence pRNA	BM	FS	365
Powell Butte RNA	BM	BLM	510
Shaketable RNA	BM	FS	389
Sheep Mountain ACEC	BM	BLM	5292
Sheep Rock RNA	BM	NPS	1064
Silver Creek pRNA	BM	FS	802
Silver Creek RNA	BM	BLM	1933
South Fork Walla Walla River ACEC	BM	BLM	2042
South Ridge Bully Creek RNA	BM	BLM	620
Standley pRNA	BM	FS	742
Stinger Creek pRNA	BM	FS	1663
Strawberry Mountain pRNA	BM	FS	107
Sturgill pRNA	BM	FS	139
Tenderfoot Basin pRNA	BM	FS	891
The Island pRNA	BM	FS	82
The Island RNA	BM	BLM	199
Vance Knoll RNA	BM	FS	188
Vinegar Hill pRNA	BM	FS	424
Wenaha Breaks RNA	BM	FS	1702
West Razz Lake pRNA	BM	FS	47
Zumwalt Prairie Preserve	BM	TNC	36102
Abert Rim ACEC	BR	BLM	18047
Benjamin RNA	BR	BLM	637
Big Alvord Creek RNA	BR	BLM	1677
Billy Burr Lake	BR	BLM	545
Black Canyon - Vale RNA	BR	BLM	2639
Black Hills RNA	BR	BLM	3048
Borax Lake ACEC	BR	BLM	761
Borax Lake Preserve	BR	TNC	319
Coal Mine Basin RNA	BR	BLM	756
Connley Hills RNA	BR	BLM	3599
Crooked Creek SNA	BR	PRD	564
Crump Lake Preserve	BR	TNC	604
Crump Lake South	BR	DSL	990
Dry Creek Bench RNA	BR	BLM	1638
Dry Creek Gorge ACEC	BR	BLM	16037
East Fork Trout Creek RNA	BR	BLM	362
East Kiger Plateau RNA	BR	BLM	1217
Fish Creek Rim RNA	BR	BLM	8724
Foley Lake RNA	BR	BLM	2229
Foster Flat RNA	BR	BLM	2686

Natural Area Name	Ecoregion	Ownership	Area (acres)
Guano Creek-Sink Lakes RNA	BR	BLM	11194
Hammond Hill Sand Hills RNA	BR	BLM	3715
Harney Lake RNA	BR	FWS	28448
Hawksie-Walksie RNA	BR	BLM	17317
High Lakes ACEC	BR	BLM	38974
Honeycombs RNA	BR	BLM	15864
Jordan Craters ACEC	BR	BLM	31394
Juniper Mountain RNA	BR	BLM	6331
Lake Ridge RNA	BR	BLM	3858
Leslie Gulch ACEC	BR	BLM	11680
Little Blitzen RNA	BR	BLM	2256
Little Whitehorse Creek RNA	BR	BLM	61
Little Wildhorse Lake RNA	BR	BLM	241
Long Draw RNA	BR	BLM	441
Lost Forest RNA	BR	BLM	8921
Mahogany Ridge RNA	BR	BLM	681
Mendi Gore Playa RNA	BR	BLM	149
Mickey Basin RNA	BR	BLM	560
Owyhee Below Dam ACEC	BR	BLM	11221
Palomino Playa RNA	BR	BLM	643
Poker Jim Ridge RNA	BR	FWS	639
Pueblo Foothills RNA	BR	BLM	2426
Rahilly-Gravelly RNA	BR	BLM	18695
Red Knoll ACEC	BR	BLM	11128
Rooster Comb RNA	BR	BLM	683
Saddle Butte ACEC	BR	BLM	7061
Serrano Point RNA	BR	BLM	679
South Alkali Sand Hills ACEC	BR	BLM	3522
South Bull Canyon RNA	BR	BLM	789
South Fork Willow Creek RNA	BR	BLM	186
South Warner Basin	BR	BLM	1236
Spanish Lake RNA	BR	BLM	4699
Spring Mountain RNA	BR	BLM	1003
Stinking Lake RNA	BR	FWS	1556
Stockade Mountain RNA	BR	BLM	1767
Succor Creek SNA	BR	PRD	2244
Table Rock ACEC	BR	BLM	5138
Toppin Creek Butte RNA	BR	BLM	4001
Tum Tum Lake RNA	BR	BLM	1691
Boardman Grasslands Managed Area	CB	TNC/DOD/Private	22622
Boardman RNA	CB	DOD	5654
Lawrence Memorial Grassland	CB	TNC	377
Lindsay Prairie Preserve	CB	TNC	353

Natural Area Name	Ecoregion	Ownership	Area (acres)
Squally Point Dunes SNA	CB	PRD	39
Tygh Valley SNA	CB	PRD	57
Beaver Creek SNA	CR	PRD	377
Big Creek Preserve	CR	TNC	204
Blacklock Point SNA	CR	PRD	1021
Blind Slough Swamp	CR	TNC	801
Bradley Bog Preserve	CR	TWC	47
Butterfield Fen Preserve	CR	TWC	56
Cape Blanco SNA Reserve	CR	PRD	283
Cape Ferrelo SNA	CR	PRD	19
Cape Lookout SNA - The Cape	CR	PRD	415
Cape Meares SNA Reserve	CR	PRD	233
Cape Sebastian SNA	CR	PRD	246
Carl Washburne Blowout Ponds SNA	CR	PRD	44
Cascade Head Preserve	CR	TNC	309
Cherry Creek RNA	CR	BLM	591
Coquille River Falls RNA	CR	FS	530
Crissey Field SNA	CR	PRD	11
Cummins/Gwynn Creeks RNA	CR	FS	6498
Flynn Creek RNA	CR	FS	649
Grass Mountain RNA	CR	BLM	705
High Peak - Moon Creek RNA	CR	BLM	1491
Humbug Mountain SNA	CR	PRD	735
Ian Peterson-Nedry Preserve (Woahink Bog)	CR	TWC	103
Indian Sands SNA	CR	PRD	98
Little Wallace Island	CR	DSL	7
Lost Prairie ACEC	CR	BLM	61
Myrtle Island RNA	CR	BLM	23
Nesika Beach Preserve	CR	TNC	46
Neskowin Crest RNA	CR	FS	1169
New River ACEC	CR	BLM	1136
Onion Peak Preserve	CR	TNC	410
Onion Peak SNA Reserve	CR	DSL	580
Ophir Dunes	CR	DOT	54
Otter Point SNA	CR	PRD	72
Port Orford Cedar RNA	CR	FS	1100
Reneke Creek RNA	CR	FS	393
Saddle Bag Mountain RNA	CR	BLM	206
Saddle Mountain SNA	CR	PRD	3192
Sand Lake RNA	CR	FS	209
Skull Island	CR	DSL	25
Sutton Lake Swamp Preserve	CR	TNC	14
Tenmile Creek RNA	CR	FS	161

Natural Area Name	Ecoregion	Ownership	Area (acres)
Twin Rocks SNA	CR	PRD	44
Umpqua Lighthouse State Park	CR	PRD	375
Umpqua River Wildlife Area-Brads Creek ACEC	CR	BLM	166
Wassen Creek ACEC	CR	BLM	3396
Wheeler Creek RNA	CR	FS	338
Winchuck Slope SNA Reserve	CR	OPAC	189
Augur Creek RNA	EC	FS	2108
Bluejay RNA	EC	FS	788
Cannon Well RNA	EC	FS	664
Collier Memorial SNA	EC	PRD	186
Columbia Oaks SNA	EC	PRD	50
Cultus River RNA	EC	FS	315
Ewauna Flat Preserve	EC	TNC	7
Fourmile Wetlands Preserve	EC	TNC	1855
Goodlow Mountain RNA	EC	FS	1240
Memaloose SNA	EC	PRD	76
Metolius River Preserve	EC	Deschutes Land Trust	1272
Metolius RNA	EC	FS	1343
Mill Creek Ridge RNA	EC	FS	831
Miller Island WMA	EC	OFW	2422
Mokst Butte RNA	EC	FS	1323
Old Baldy RNA	EC	BLM	521
Pringle Falls RNA	EC	FS	1343
Rowena Plateau SNA	EC	PRD	236
Silver Lake Exclosure RNA	EC	FS	262
Sycan Marsh Preserve	EC	TNC	30060
Tom McCall at Rowena Preserve	EC	TNC	231
Vee Pasture RNA	EC	FS	623
Wechee Butte RNA	EC	FS	357
Wildhaven Preserve	EC	TNC	161
Williamson River Delta - Goose Bay Preserve	EC	TNC	2733
Williamson River Delta Preserve	EC	TNC	4540
Yainax Butte ACEC	EC	BLM	708
Ace Williams Mountain	KM	BLM	281
Agate Desert Preserve	KM	TNC	49
Ashland RNA	KM	FS	1309
Bear Gulch RNA	KM	BLM	353
Beatty Creek RNA	KM	BLM	865
Bobby Creek RNA	KM	BLM	1915
Brewer Spruce RNA	KM	BLM	1706
Bushnell-Irwin Rocks RNA	KM	BLM	1088
Cedar Log Flat RNA	KM	FS	418
Denman Wildlife Area	KM	OFW	2091

Natural Area Name	Ecoregion	Ownership	Area (acres)
Eight Dollar Mountain Preserve	KM	TNC	44
Eight Dollar Mountain SNA	KM	PRD	651
French Flat ACEC	KM	BLM	654
Grayback Glades RNA	KM	BLM	1020
Holton Creek RNA	KM	BLM	422
Hoover Gulch RNA	KM	FS	1311
Hunter Creek Bog ACEC	KM	BLM	722
Illinois River Forks SNA	KM	PRD	271
Lemmingsworth Gulch RNA	KM	FS	1037
Lost Lake RNA	KM	BLM	387
North Fork Chetco ACEC	KM	BLM	603
North Fork Hunter Creek ACEC	KM	BLM	1926
North Fork Silver Creek RNA	KM	BLM	499
North Myrtle Creek RNA	KM	BLM	453
Oliver Mathews / Craggy Peaks pRNA	KM	FS	1106
Oregon Gulch RNA	KM	BLM	1052
Pipe Fork RNA	KM	BLM	517
Popcorn Swale Preserve	KM	TNC	33
Red Mountain pRNA	KM	FS	247
Rogue River Plains Preserve	KM	TNC	127
Rough And Ready ACEC	KM	BLM	1191
Rough and Ready Creek Preserve	KM	TNC	112
Rough And Ready SNA	KM	PRD	30
Round Top Butte Preserve	KM	TNC	140
Round Top Butte RNA	KM	BLM	606
Scotch Creek RNA	KM	BLM	1781
Table Rocks ACEC	KM	BLM	240
Table Rocks Preserve	KM	TNC	1248
Whetstone Savanna Preserve	KM	TNC	228
Woodcock Bog RNA	KM	BLM	265
Woodcock Creek	KM	DSL	640
Bandon Marsh NWR	ME	FWS	1918
Boiler Bay RR	ME	OPAC	45
Brookings RR	ME	OPAC	151
Bull Island SNA	ME	DSL	60
Cape Arago MG and Simpson Reef SNA	ME	PRD	236
Cape Arago RR	ME	OPAC	268
Cape Falcon MR	ME	OPAC	7919
Cape Falcon West MPA	ME	OPAC	4720
Cape Lookout SNA - The Salt Marsh	ME	PRD	531
Cape Perpetua MR	ME	OPAC	9008
Cape Perpetua Seabird Protection Area	ME	OPAC	14225
Cascade Head MR	ME	OPAC	6173

Natural Area Name	Ecoregion	Ownership	Area (acres)
Cascade Head South MPA	ME	OPAC	6144
Cascade Head West MPA	ME	OPAC	827
Cox Island Preserve	ME	TNC	196
Davis Slough	ME	DSL	62
Gregory Point RR	ME	OPAC	61
Nehalem Bay SNA	ME	PRD	70
Neptune State Park RR	ME	OPAC	54
Nestucca Bay NWR	ME	FWS	362
Netarts Spit SNA Reserve	ME	PRD	385
North Spit ACEC	ME	BLM	709
Otter Rock MG	ME	OPAC	53
Otter Rock MR	ME	OPAC	740
Pirate Cove RR	ME	OPAC	8
Redfish Rocks MPA	ME	OPAC	3266
Redfish Rocks MR	ME	OPAC	1683
Smith Island	ME	DSL	11
South Slough National Estuarine RR	ME	DSL/NOAA	4779
Tenasillahe Island RNA	ME	FWS	1937
Tillamook Bay Preserve	ME	TNC	
West Sand Island	ME	DOD	495
Whale Cove Habitat Refuge	ME	OPAC	32
Whalen Island SNA	ME	PRD	95
Yaquina Estuary - McCaffery/Poole Sloughs	ME	TWC	1
Abbott Creek RNA	WC	FS	2762
Ainsworth State Park	WC	PRD	179
Bagby RNA	WC	FS	624
Benson SNA	WC	PRD	60
Big Bend Mountain pRNA	WC	FS	4829
Bridal Veil Falls SNA	WC	PRD	25
Bull Run RNA	WC	FS	374
Cache Mountain RNA	WC	FS	1602
Carolyns Crown RNA	WC	BLM	266
Cherry Creek Basin RNA	WC	FS	9592
Coopey Falls SNA	WC	PRD	13
Cougar Butte RNA	WC	FS	2646
Desert Creek RNA	WC	NPS	1787
Elowah Falls SNA	WC	PRD	68
Gold Lake Bog RNA	WC	FS	439
Gumjuwac-Tolo RNA	WC	FS	3675
Hagan RNA	WC	FS	1097
Horse Rock Ridge Preserve	WC	TNC	68
Horse Rock Ridge RNA	WC	BLM	378
Katsuk Butte RNA	WC	FS	883

Natural Area Name	Ecoregion	Ownership	Area (acres)
Latourell Falls SNA	WC	PRD	90
Limpy Rock RNA	WC	FS	1981
Llao Rock RNA	WC	NPS	415
Many Lakes RNA	WC	FS	843
Mckenzie Pass RNA	WC	FS	1284
Middle Santiam RNA	WC	FS	1190
Mohawk RNA	WC	BLM	289
Multnomah Falls SNA	WC	FS	397
Multorpor Fen	WC	FS	56
Olallie Ridge RNA	WC	FS	732
Pumice Desert RNA	WC	NPS	2884
Red Pond RNA	WC	BLM	141
Rigdon Point RNA	WC	FS	469
Rooster Rock SNA	WC	PRD	516
Sandy River Gorge Preserve	WC	TNC	316
Sandy River Gorge RNA	WC	BLM	74
Sharon Fen Preserve	WC	TNC	1649
Sherwood Butte pRNA	WC	FS	1485
Sphagnum Bog RNA	WC	NPS	169
Squaw Flat RNA	WC	FS	537
Starvation Creek SNA	WC	FS	120
Tater Hill RNA	WC	BLM	303
Three Creek RNA	WC	FS	727
Torrey Charlton RNA	WC	FS	660
Upper Elk Meadows RNA	WC	BLM	223
Wickiup Springs pRNA	WC	FS	1563
Wildcat Mountain RNA	WC	FS	1495
Bald Hill Natural Area	WV	City of Corvallis	284
Beggars-Tick Wildlife Refuge	WV	Metro	21
Camas Swale RNA	WV	BLM	313
Camassia Preserve	WV	TNC	27
Coburg Ridge Preserve	WV	TNC	1270
Cogswell-Foster Preserve	WV	TNC	92
Fern Ridge RNA	WV	DOD	298
Flagg Island	WV	Metro	15
Forest Peak RNA	WV	BLM	142
Fox Hollow RNA	WV	BLM	161
Gary Island	WV	Metro	49
Jackson-Frazier Wetland	WV	Benton County	147
Killin Wetlands	WV	Metro	590
Kingston Prairie Preserve	WV	TNC	148
Little Rock Island SNA	WV	PRD	38
Little Sink RNA	WV	BLM	80

Natural Area Name	Ecoregion	Ownership	Area (acres)
Long Tom ACEC	WV	BLM	8
Luckiamute Landing SNA	WV	PRD	291
Maple Knoll RNA	WV	FWS	107
Noble Oaks	WV	TNC	471
Peach Cove Fen Natural Area	WV	Metro	87
Philomath Preserve	WV	TNC	120
Pigeon Butte RNA	WV	FWS	75
Rattlesnake Butte Preserve	WV	Grande Ronde Tribes	51
Scappoose Bay SNA	WV	PRD	300
The Butte RNA	WV	BLM	40
Wilhoit Springs Park	WV	Clackamas County	16
Willamette Confluence Preserve	WV	TNC	1247
Willow Creek Preserve	WV	TNC	514
Wren Prairie Preserve	WV	TNC	9
Yamhill Oaks Preserve	WV	TNC	300

Jackson-Fraser Wetland. Photo from Benton Soil and Water Conservation District.

APPENDIX 2B. OTHER DESIGNATED AREAS CONSERVING NATURAL AREA PLAN SPECIES OR ECOYSTEMS

Name	Ecoregion	Owner
Alfred A. Loeb State Park	CR	PRD
Alvord Desert ACEC	BR	BLM
Alvord Desert WSA	BR	BLM
Ankeny NWR	WV	FWS
Babyfoot Lake Botanical Interest Area	KM	FS
Badger Creek WA	EC	FS
Baker Cypress ACEC	KM	BLM
Baskett Slough NWR	WV	FWS
Big Craggies SIA	KM	FS
Big Marsh	EC	FS
Big Marsh Headwall	EC	FS
Biscuitroot ACEC	BR	BLM
Boulder Creek WA	WC	FS
Bridge Creek WMA	BR	FWS
Buford County Park	WV	Lane Co.
Burlington Bottoms	WV	OFW
Bushnell-Irwin Rocks ACEC	KM	BLM
Cape Arago State Park	CR	PRD
Cape Arago/Seven Devils PMR	ME	OPAC
Cape Blanco State Park	CR	PRD
Cape Kiwanda pSNA	CR	PRD
Cape Lookout State Park	CR	PRD
Cape Perpetua pSNA	CR	PRD
Cascade Siskiyou NM	KM	BLM
Champoeg State Heritage Area	WV	PRD
Chrome Ridge SIA	KM	FS
Cold Springs NWR	CB	FWS
Columbia Gorge NSA	Multiple	Multiple
Columbia WA	WC	FS
Crane Prairie WMA	BM	FS
Crater Lake NP	WC	NPS
Crook Point NWR	CR	FWS
Crook Point/Mack Reef	CR	DSL
Crooked River National Grassland	BM	FS
Crump Lake pSNA	BR	DSL
Darlingtonia SNA	CR	PRD
Denman WMA	KM	OFW
Deschutes WSR	CB	BLM/State
Diamond Craters ONA-ACEC	BR	BLM

Name	Ecoregion	Owner
Diamond Peak WA	WV	FS
Drift Creek WA	CR	FS
Dry Creek Buttes WSA	BR	BLM
Eagle Cap WA	BM	FS
East Alvord WSA	BR	BLM
East Sand Island	WV	ACE
Ecola State Park	CR	PRD
Eel Creek Botanical Area	CR	FS
Elijah Bristow State Park	WV	PRD
Fir Groves pACEC	BR	BLM
Fish Creek Meadows - Steens Mountain WA	BR	BLM
Fort Rock SNA	BR	PRD
Goat Island pSNA	CR	DSL
Grassy Knob WA	CR	FS
Grassy Mountain ACEC	WC	BLM
Grayback Mountain SIA	KM	FS
Green Knob SIA	KM	FS
Guano Slough pRNA	BR	BLM
Guy W. Talbot State Park	WC	PRD
Harney Hot Springs	BR	BLM/FWS
Harris Beach State Park	CR	PRD
Hart Mountain National Antelope Refuge	BR	FWS
Hat Rock State Park	CB	PRD
Haystack Rock pSNA	CR	PRD
Heceta Dunes ACEC	CR	BLM
Hells Canyon WA	BM	FS
Hidden Lake-Lulu Lake SIA	WC	FS
Hilgard Junction State Recreation Area	BM	PRD
Hinkle Lake SIA	KM	FS
Humbug Mountain State Park	CR	PRD
Hunt Mountain ACEC	BM	BLM
Hunter Creek Bog ACEC/SIA	CR	BLM/FS
Hurricane Creek-Eagle Cap WA	BM	FS
Illinois River Forks State Park	KM	PRD
Imnaha WSR	BM	FS
Innes Market Road ACEC	BM	BLM
Irrigon WA	CB	OFW
Jessie M. Honeyman State Park	CR	PRD
John Day Fossil Beds NM	BM	NPS
John Day WSR	CB	BLM
Kalmiopsis WA	KM	FS
Klamath Marsh NWR	EC	FWS
Klamath WMA	EC	DSL

Name	Ecoregion	Owner
L. Presley and Vera C. Gill State Park	CR	PRD
Ladd Marsh WMA	BM	OFW
Lake Abert ACEC	BR	BLM
Lake Marie - Umpqua Lighthouse State Park pSNA	CR	PRD
Lewis and Clark NHP	CR	NPS
Lewis and Clark NWR	CR	FWS
Lower Klamath NWR	EC	FWS
Lower Owyhee Canyon WSA	BR	BLM
Malheur Lake Exclosures	BR	FWS
Malheur NWR	BR	FWS
Mayer State Park	EC	PRD
Memaloose State Park	EC	PRD
Menagerie WA	WC	FS
Mickey Hot Springs ACEC	BR	BLM
Middle Santiam River Terrace ACEC	WC	BLM
Miller Lake SIA	KM	FS
Minam State Park	BM	PRD
Mountain Lakes WA	WC	FS
Mt. Hood WA	WC	FS
Mt. Jefferson WA	WC	FS
Mt. Thielsen WA	WC	FS
Mt. Washington WA	WC	FS
Neskowin Marsh-Nestucca Bay NWR	CR	FWS
Nestucca Spit State Park	CR	PRD
North Cove - Cape Arago pSNA	CR	PRD
North Fork Chetco River ACEC	CR	BLM
North Fork Crooked River ACEC	BM	BLM
North Fork John Day WA	BM	FS
North Umpqua WSR	WC	FS
Oregon Caves NM	KM	NPS
Oregon Dunes NRA	CR	FS
Oregon Islands NWR	CR	FWS
Oswald West State Park	CR	PRD
Owyhee Breaks WA	BR	FS
Owyhee River Canyon WA	BR	FS
Painted Hills - John Day Fossil Beds NM	BM	NPS
Philip W. Schneider WMA (Murderers Creek WMA)	BM	OFW
Pistol River State Scenic Viewpoint	CR	PRD
Ponderosa Pine pACEC	WV	BLM
Port Orford Heads State Park	CR	PRD
Poverty Flat ACEC	KM	BLM
Prescott Park	WV	City of Corvallis
Prineville WMA	BM	OFW

Name	Ecoregion	Owner
Red Buttes WA	KM	FS
Red Flat SIA	KM	FS
Rogue Reef pSNA	CR	DSL
Rogue River WSR	CR	FS
Rogue-Umpqua WA	WC	FS
Russian Island pRNA	CR	FWS
Sagehen Hills WSA	BR	FWS
Salmon-Huckleberry WA	WC	FS
Sand Dunes WSA	BR	BLM
Sauvie Island WMA	WV	OFW
Seneca Fouts Memorial SNA	WV	PRD
Shore Acres State Park	CR	PRD
Silver Falls State Park	WV	PRD
Siskiyou Pass ACEC	KM	BLM
Sky Lakes WA	WC	FS
Slickrock Creek - Eagle Cap WA	BM	FS
Slide Mountain SIA	EC	FS
Smelt Sands State Park	CR	PRD
Smith Rock State Park	BM	PRD
Snake WSR	BM	FS
Soda Mountain WSA	KM	BLM
Sourgame SIA	KM	FS
South Fork Walla-Walla River ACEC	BM	FS
South Slough National RR	CR	DSL
Spaulding WSA	BR	BLM
Starvation Creek State Park	WC	PRD
Steens Mountain WA	BR	BLM
Strawberry Mountain WA	BM	FS
Summer Lake WMA	BR	OFW
Sunset Beach pSNA	CR	PRD
Sutton Mountain WA	BM	BLM
Tenmile closure area	CR	FS
Three Sisters WA	WC	FS
Touvelle State Recreation Site	KM	PRD
Tygh Valley State Wayside	CB	PRD
Umatilla NWR	CB	FWS
Upper Klamath NWR	EC	FWS
Upper West Little Owyhee WSA	BR	BLM
Valley of the Giants ONA-ACEC	CR	BLM
Viento State Park	WC	PRD
Vinegar Hill-Indian Rocks SIA	BM	FS
Waldo Lake WA	WC	FS
Walker Flat ACEC	CR	BLM

Name	Ecoregion	Owner
Warner Wetlands ACEC	BM	BLM
Wenaha-Tucannon WA	BM	FS
White River WMA	EC	OFW
White Rock Fen ACEC	CR	BLM
Wild Rogue WA	CR	FS
William L. Finley NWR	WV	FWS
William M. Tugman State Park	CR	PRD
William P. Keady pSNA	ME	PRD
Yachats MG	ME	DSL
Yachats pSNA	ME	DSL

Waldo Lake, in Waldo Lake Wilderness Area, U.S. Forest Service photograph.