



# *the* OREGON CONSERVATION STRATEGY



## Chapter 3: Ecoregions



2016  
Oregon Department  
of Fish and Wildlife



[OregonConservationStrategy.org](http://OregonConservationStrategy.org)

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### **PDF Content Last Updated April 12, 2017**

This PDF is a chapter of the Oregon Conservation Strategy, the official State Wildlife Action Plan for Oregon. The complete Oregon Conservation Strategy is available online at <http://oregonconservationstrategy.org/>. Since Conservation Strategy content will be updated periodically, please check the website to ensure that you are using the most current version of downloadable files.

### **Contact ODFW**

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### **Recommended Citation**

Oregon Conservation Strategy. 2016. Oregon Department of Fish and Wildlife, Salem, Oregon.

### **Cover Photos**

Banner: American marten, USFWS; monarch butterfly, Derek Ramsey, Wikipedia; Greater Sage-Grouse, Jeannie Stafford, USFWS; coho salmon, BLM; western lily, ODA; western pond turtle, Keith Kohl, ODFW

Featured image: Zumwalt Prairie in the Blue Mountains ecoregion, Martin Nugent, ODFW



Photo Credit: Mike Gray

## ECOREGIONS

Oregon Conservation Strategy ecoregions provide information on each of Oregon’s nine ecoregions, which are portions of the state with similar climate and vegetation. Information is provided on the characteristics, conservation issues and priorities, limiting factors, recommended approaches, [Strategy Species](#), and [Strategy Habitats](#) for each ecoregion. To see a map of the ecoregions, see below or visit the [Oregon Department of Fish and Wildlife \(ODFW\) Compass](#) mapping application.



For the inland portion of the state, the Strategy uses the Environmental Protection Agency's (EPA) Level III Ecoregions, but combines the Snake River Plain with the Northern Basin and Range. The Strategy designates the Nearshore ecoregion from the outer boundary of Oregon's Territorial Sea at 3 nautical miles to the supratidal zone affected by wave spray and overwash at extreme high tides on our ocean shoreline, and up into the portions of estuaries where species depend on the saltwater that comes in from the ocean.



*Photo Credit: Keith Kohl, ODFW*

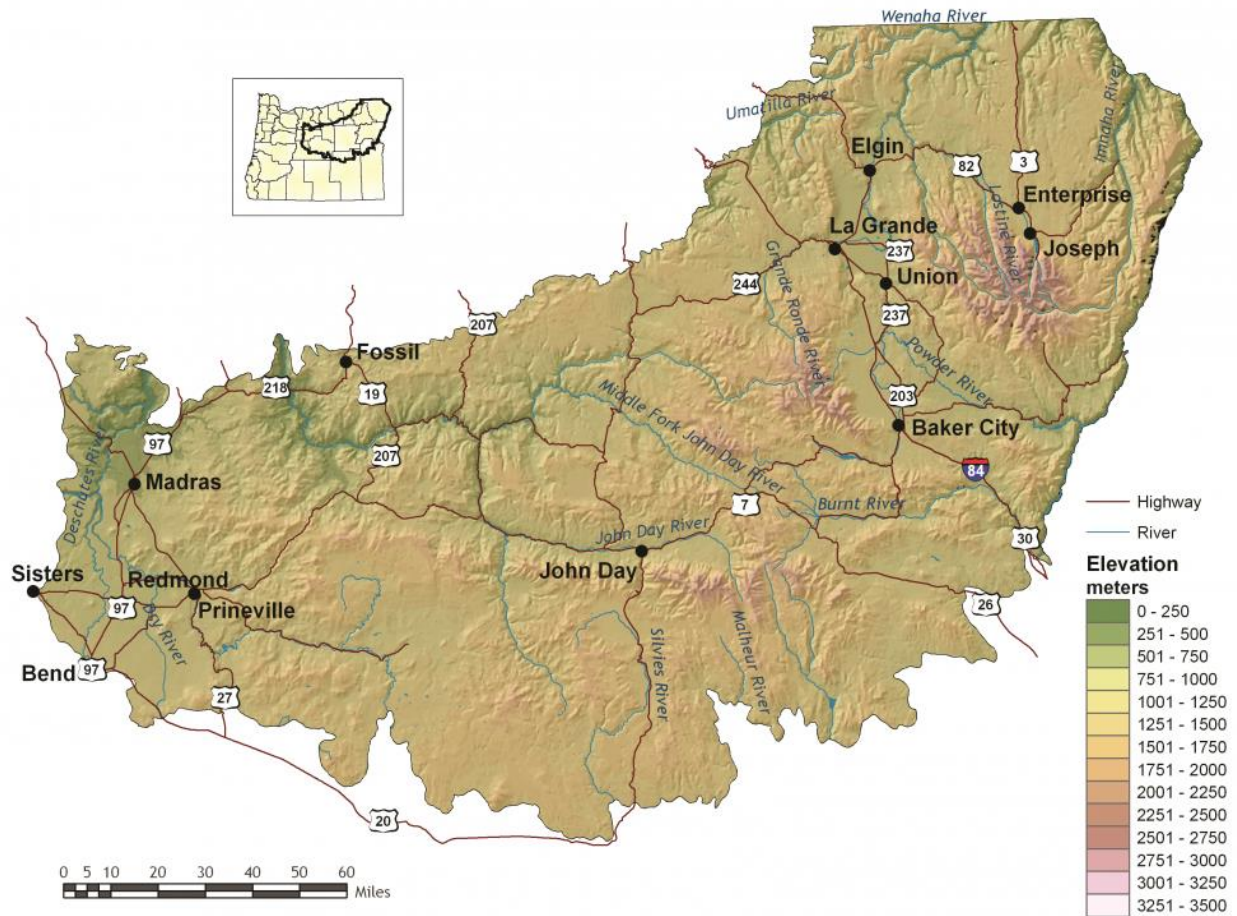
## BLUE MOUNTAINS

### DESCRIPTION

At 23,984 square miles, the Blue Mountains ecoregion is the largest ecoregion in Oregon. Although named for its largest mountain range, the Blue Mountains ecoregion is a diverse complex of mountain ranges, valleys, and plateaus that extends beyond Oregon into the states of Idaho and Washington. This ecoregion contains deep rock-walled canyons, glacially-cut gorges, sagebrush steppe, juniper woodlands, mountain lakes, forests, and meadows. Broad alluvial-floored river valleys support ranches surrounded by irrigated hay meadows and wheat fields. The climate varies over broad temperature and precipitation ranges because of elevational differences. Overall, the ecoregion has short, dry summers and long, cold winters. Because much of the precipitation falls as snow, snow melt gives life to the rivers and irrigated areas.

Wood products and cattle production dominate the economy of the ecoregion, but dryland wheat and alfalfa are important in the river valleys. The ecoregion supports some of the finest big game hunting in the state and attracts tourists year-round, offering scenic lakes and rivers, geologic features, and alpine areas. It includes the Prineville-Bend-Redmond area, one of the fastest growing areas in the state, along with the cities of La Grande, Baker, Enterprise, and John Day.

## CHARACTERISTICS



### Important Industries

Agriculture, livestock (e.g., beef cattle, dairy cattle, sheep, poultry, hogs), forest products, manufacturing, recreation (e.g., hunting, fishing, skiing, camping)

### Major Crops

Wheat, alfalfa, potatoes, onions, sugar beets, carrots, field corn, mint

### Important Nature-based Recreational Areas

John Day Fossil Beds National Monument, Hell's Canyon National Recreational Area and Hell's Canyon Wilderness, Wallowa Lake, Umatilla National Wildlife Refuge, John Day and Grande Ronde Rivers, Lake Billy Chinook, Smith Rock, and wilderness areas (especially Eagle Cap, Strawberry Mountain, North Fork John Day, and Wenaha-Tucannon Wildernesses)

## Elevation

1,000 feet (Snake River) – 9,838 feet (Sacajawea Peak)

## Important Rivers

Deschutes, Grande Ronde, Imnaha, John Day, Malheur, Powder, Silvies, Snake, Umatilla, Wallowa

## Ecologically Outstanding Areas

Malheur headwaters, Bear Valley, and the Umatilla-Walla Walla headwaters

## CONSERVATION ISSUES AND PRIORITIES

While the Blue Mountains ecoregion contains some of the largest intact native grasslands in the state and several large areas managed for conservation values, habitats have been impacted by interrelated changes in ecological processes due to fire suppression, selective harvest practices, and unsustainable grazing. These changes have increased vulnerability of forests to insects, disease, and uncharacteristically severe wildfire. Similarly, these changes have led to increased invasive species and increased vulnerability to wildfire in sagebrush shrublands and steppe.

Habitat loss has been the most severe in lower elevation valley bottom habitats, such as riparian areas, wetlands, and shrublands, where native vegetation has been converted to agricultural uses. These low-elevation habitats are highly fragmented. Therefore, maintaining connectivity and corridors for wildlife is especially important in these areas. Increasing recreational pressure and invasive species can potentially impact all habitats in this ecoregion.

**Key Conservation Issues** (KCI) of particular concern in the Blue Mountains ecoregion include **Disruption of Disturbance Regimes** (fire), **Land Use Changes**, **Water Quality and Quantity**, and **Invasive Species**. In addition to the statewide issues, uncontrolled off-highway recreational vehicle use and unregulated horse herds are of increasing concern in this ecoregion.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

#### Altered Fire Regimes

In ponderosa pine habitat types, fire suppression and past forest practices have resulted in young, dense mixed-species stands where open, park-like stands of ponderosa pine once dominated. Increasingly dominated by smaller Douglas-firs and true firs, the forests are at greater risk of severe wildfire, disease, and damage by insects. Dense understories and insect-killed trees make it difficult to reintroduce natural fire regimes because hazardous fuel levels increase the risk of stand-replacing fires. Efforts to reduce fire danger and improve forest health may help to restore habitats but require careful planning



to provide sufficient habitat features that are important to wildlife (e.g., snags, downed logs, hiding cover). Similarly, wildfire reforestation efforts should be carefully planned to create stands with tree diversity, understory vegetation, and natural forest openings.

### **Recommended Approach**

Use an integrated approach to forest health issues that considers historical conditions, wildlife conservation, [natural fire intervals](#), and silvicultural techniques. Encourage forest management at a broad scale to address limiting factors. Implement fuel reduction projects to reduce the risk of forest-destroying wildfires, considering site-specific conditions and goals. Fuel reduction strategies need to consider the habitat structures that are important to wildlife, such as snags and downed logs, and make an effort to maintain them. Reintroduce fire where feasible; prioritize sites and applications. Carefully planned prescribed burns enhance quality of forage and cover for wintering deer and elk. Maintain important wildlife habitat features, such as snags and logs, at a level to sustain wood-dependent species. Monitor forest health initiatives, and use adaptive management techniques to ensure efforts are meeting habitat restoration and wildfire prevention objectives with minimal impacts on wildlife.

### **Limiting Factor:**

#### Low-Elevation Sites Vulnerable

Although a large number of acres in this ecoregion are managed for wildlife and recreational values, these areas are primarily limited to higher mountain forests and alpine areas, or steep canyonlands. Lower elevation vegetation types, such as valley bottom [grasslands](#), [riparian](#) areas, [wetlands](#), and [shrublands](#), are mostly on private lands. Most remnant low-elevation native habitats occur as fragmented patches with poor connectivity.

### **Recommended Approach**

Because important low-elevation habitats are primarily privately-owned, [working with private landowners](#) and local governments on voluntary cooperative approaches to improve habitat is the key to long-term conservation using tools such as financial incentives, regulatory assurance agreements, and conservation easements. Where feasible, maintain and restore habitats using a landscape approach to increase connectivity between habitat patches.

### **Limiting Factor:**

#### Development and Increased Growth

The western portion of the Blue Mountains includes the Madras, Redmond, Prineville, and eastern Bend area, one of the fastest growing regions of the state. Rapid conversion to urban uses threatens habitats and traditional land uses such as agriculture. Impacts to mule deer winter range are of particular concern. Northeast Oregon is increasingly popular with vacationers, and habitat fragmentation due to rural development is a concern in some areas.

### **Recommended Approach**

As in low-elevation habitats, cooperative approaches with private landowners are critical. Work with community leaders and agency partners to ensure planned, efficient growth. Support and implement existing [land use regulations](#) to preserve farmland and rangeland, open spaces, recreation areas, and natural habitats.

### **Limiting Factor:**

#### Recreational Vehicle Use

Use by off-highway vehicles (OHVs) has increased dramatically in recent years. When limited and controlled, OHV use can be compatible with wildlife conservation. However, unlimited and uncontrolled use can impact riparian, aquatic, and other sensitive habitats, spread invasive plant seeds, increase fire danger, and affect wildlife behavior and distribution, especially during critical breeding and wintering periods. Also, use of forest roads can affect wildlife behavior and distribution, depending on road type and traffic levels.

### **Recommended Approach**

Work cooperatively with land managers and OHV groups to direct use to maintained trails in low-impact areas and minimize growth of OHV use. Conduct research on effects of OHVs on wildlife behavior and populations (e.g., research conducted at Starkey Experimental Forest, U.S. Forest Service (USFS)). Support efforts to control OHV use on public lands, particularly in highly sensitive habitats, and restore damaged areas. For example, the USFS is looking into closing some non-priority forest roads. Encourage development and use of designated roads and trails, maintain hiding cover along open roads, and/or seasonally-close roads during sensitive periods, such as calving or wintering.

### **Limiting Factor:**

#### Water Distribution in Arid Areas and Wildlife Entrapment in Water Developments

In arid areas, water availability can limit animal distribution. Water developments established for cattle, deer, and elk can significantly benefit birds, bats, and small mammals. However, some types of these facilities, particularly water developments for livestock, can have unintentional hazards. These hazards include over-hanging wires that act as trip lines for [bats](#), steep side walls that act as entrapments under low water conditions, or unstable perches that cause animals to fall into the water. If an escape ramp is not provided, small animals cannot escape and will drown.

### **Recommended Approach**

Continue current efforts to provide water for wildlife in arid areas. Continue current design of big game and game bird “guzzlers” that accommodate a variety species, and retrofit older models where appropriate to make them compatible with newer design standards. Use and maintain [escape](#)

devices on water developments where animals can become trapped. Remove obstacles that could be hazardous to wildlife from existing developments.

**Limiting Factor:**

Unregulated Horse Herds Disturb Wildlife and Compete for Water and Other Resources

Oregon's herds of wild horses are a well-recognized feature on rangeland, but the herds require intensive management attention, including resource-intensive adoption and translocation programs allowed under the Wild Horse & Burro Act (BLM 1971). Unregulated horse herds negatively impact native vegetation, compete with wildlife for water and food, and disrupt habitat use by wildlife. Currently, this issue is limited to a small but important part of the Blue Mountains ecoregion in the Murderers Creek area.

**Recommended Approach**

Promote dialogue between wildlife managers, land owners, and land managers to develop management plans based on common priorities. Promote outreach to explain the issue to the public. Use opinion polling results to inform management decisions and help agencies balance multiple priorities.

**Limiting Factor:**

Invasive Species

Invasive plants and animals disrupt and degrade native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands. Invasive plants, particularly noxious weeds, have been on the increase during the last 30 years. While not as disruptive, invasive animals have caused problems for native wildlife species and have become a nuisance and impacted people economically.

**Recommended Approach**

Emphasize prevention, risk assessment, early detection, and quick control to prevent new invasive species from becoming fully established. Use multiple site-appropriate tools (e.g., mechanical, chemical, biological) to control the most damaging invasive species. Prioritize efforts to focus on key invasive species in high priority areas, particularly where Strategy Habitats and Strategy Species occur. Cooperate with partners through habitat programs to reduce noxious weeds and other invasive species and to educate people about invasive species issues. Promote the use of native plants for restoration and revegetation. At some sites in sagebrush communities, it may be desirable to use "assisted succession" strategies, using low seed rates of non-invasive non-native plants in conjunction with native plant seeds as an intermediate step in rehabilitating disturbances.

## STRATEGY SPECIES

American Marten (*Martes americana*)  
American Pika (*Ochotona princeps*)  
American Three-toed Woodpecker (*Picoides dorsalis*)  
Arrow-leaf Thelypody (*Thelypodium eucosmum*)  
Black-backed Woodpecker (*Picoides arcticus*)  
Bobolink (*Dolichonyx oryzivorus*)  
Bulb Juga (*Juga bulbosa*)  
Bull Trout, Deschutes SMU (*Salvelinus confluentus*)  
Bull Trout, Grande Ronde SMU (*Salvelinus confluentus*)  
Bull Trout, Hells Canyon SMU (*Salvelinus confluentus*)  
Bull Trout, Imnaha SMU (*Salvelinus confluentus*)  
Bull Trout, John Day SMU (*Salvelinus confluentus*)  
Bull Trout, Malheur River SMU (*Salvelinus confluentus*)  
Bull Trout, Umatilla SMU (*Salvelinus confluentus*)  
Bull Trout, Walla Walla SMU (*Salvelinus confluentus*)  
Burrowing Owl (*Athene cunicularia hypugaea*)  
California Myotis (*Myotis californicus*)  
Columbia Clubtail (*Gomphus lynnae*)  
Columbia Spotted Frog (*Rana luteiventris*)  
Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*)  
Cusick's Lupine (*Lupinus lepidus* var. *cusickii*)  
Fall Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Fall Chinook Salmon, Snake SMU (*Oncorhynchus tshawytscha*)  
Ferruginous Hawk (*Buteo regalis*)  
Flammulated Owl (*Psiloscops flammeolus*)  
Fringed Myotis (*Myotis thysanodes*)  
Gray Wolf (*Canis lupus*)  
Great Basin Redband Trout, Malheur Lakes SMU (*Oncorhynchus mykiss newberrii*)  
Great Gray Owl (*Strix nebulosa*)  
Greater Sage-Grouse (*Centrocercus urophasianus*)  
Greenman's Desert Parsley (*Lomatium greenmanii*)  
Hoary Bat (*Lasiurus cinereus*)  
Howell's Spectacular Thelypody (*Thelypodium howellii* ssp. *spectabilis*)  
Lewis's Woodpecker (*Melanerpes lewis*)  
Loggerhead Shrike (*Lanius ludovicianus*)  
Long-billed Curlew (*Numenius americanus*)  
Long-legged Myotis (*Myotis volans*)  
Macfarlane's Four o'Clock (*Mirabilis macfarlanei*)

Monarch Butterfly (*Danaus plexippus*)  
Olive-sided Flycatcher (*Contopus cooperi*)  
Oregon Semaphore Grass (*Pleuropogon oregonus*)  
Pallid Bat (*Antrozous pallidus*)  
Peck's Milkvetch (*Astragalus peckii*)  
Pileated Woodpecker (*Dryocopus pileatus*)  
Purple-lipped Juba (*Juba hemphilli maupinensis*)  
Red-fruited Lomatium (*Lomatium erythrocarpum*)  
Rocky Mountain Bighorn Sheep (*Ovis canadensis*)  
Rocky Mountain Tailed Frog (*Ascaphus montanus*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Snake River Goldenweed (*Pyrrocoma radiata*)  
South Fork John Day Milkvetch (*Astragalus diaphanus* var. *diurnus*)  
Spalding's Campion (*Silene spaldingii*)  
Spotted Bat (*Euderma maculatum*)  
Spring Chinook Salmon, Lower Snake SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Upper Snake SMU (*Oncorhynchus tshawytscha*)  
Summer Steelhead / Columbia Basin Redband Trout, Lower Snake SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss gairdneri*)  
Summer Steelhead / Columbia Basin Redband Trout, Mid Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss gairdneri*)  
Swainson's Hawk (*Buteo swainsoni*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Trumpeter Swan (*Cygnus buccinator*)  
Upland Sandpiper (*Bartramia longicauda*)  
Western Brook Lamprey (*Lampetra richardsoni*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Painted Turtle (*Chrysemys picta bellii*)  
Western Ridged Mussel (*Gonidea angulata*)  
Western Toad (*Anaxyrus boreas*)  
Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)  
White-headed Woodpecker (*Picoides albolarvatus*)  
Wolverine (*Gulo gulo*)

## CONSERVATION OPPORTUNITY AREAS

Baker Valley Wetlands [COA ID: 165]

Bear Valley [COA ID: 177]

Bully Creek Area [COA ID: 183]

Burnt River [COA ID: 166]  
Deschutes River [COA ID: 149]  
East Madras-Trout Creek Sagebrush and Grassland Area [COA ID: 172]  
Fields Peak [COA ID: 176]  
Grande Ronde Valley [COA ID: 159]  
Imnaha [COA ID: 161]  
Lawrence Grasslands [COA ID: 152]  
Logan Valley-John Day River Headwaters [COA ID: 179]  
Lower Deschutes River [COA ID: 148]  
Lower Grande Ronde [COA ID: 158]  
Lower John Day River [COA ID: 153]  
Malheur River Headwaters [COA ID: 180]  
Metolius Bench-Mutton Mountains Wildlife Movement Corridor [COA ID: 150]  
Middle Fork John Day River [COA ID: 170]  
North Fork John Day River 1 [COA ID: 168]  
North Fork John Day River 2 [COA ID: 169]  
North Fork Malheur-Monument Rock Area [COA ID: 182]  
Ochoco Mountains [COA ID: 173]  
Powder River Sage-Grouse Core Area [COA ID: 164]  
Rattlesnake Creek-Calamity Creek Area [COA ID: 181]  
Rock Creek-Butter Creek Grasslands [COA ID: 155]  
Silver Creek Area [COA ID: 175]  
South Fork Crooked River Area [COA ID: 174]  
South John Day River [COA ID: 171]  
Upper Grande Ronde River Area [COA ID: 160]  
Upper Silvies River [COA ID: 178]  
Walla Walla Headwaters [COA ID: 157]  
Wallowa Mountains [COA ID: 163]  
Warner West [COA ID: 198]  
Willow Creek-Birch Creek Area [COA ID: 167]  
Zumwalt Prairie Plateau [COA ID: 162]



*Photo Credit: David Patte, USFWS*

## COAST RANGE

### DESCRIPTION

Oregon's Coast Range is known for its dramatic scenery. It is also extremely diverse, with habitats ranging from open sandy dunes to lush forests and from tidepools to headwater streams. The Coast Range ecoregion includes the entire reach of the Oregon coastline and extends east through coastal forests to the border of the [Willamette Valley](#) and [Klamath Mountains](#) ecoregions.

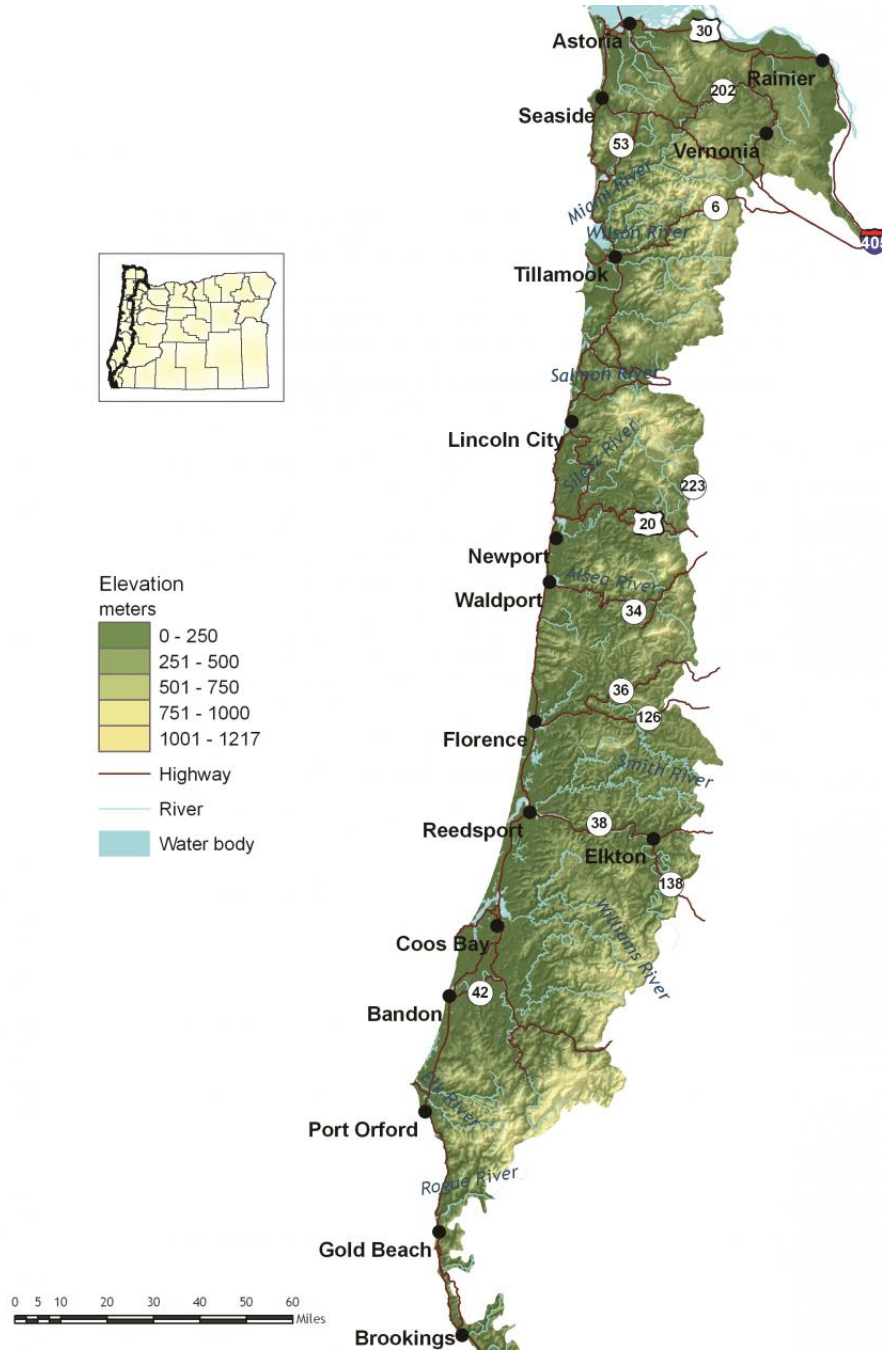
In general, the topography is characterized by steep mountain slopes and sharp ridges. Elevation varies from the ocean shoreline to Marys Peak, which is about 4,100 feet high; however, main ridge summits are approximately 1,400-2,500 feet. The Coast Range ecoregion is bordered by the [Nearshore](#) ecoregion on the ocean shores and intersects it in Oregon's estuaries.

The Coast Range's climate is influenced by cool, moist air from the ocean, and is the wettest and mildest in the state. The ecoregion's mild, moist climate creates conditions for highly productive temperate rainforests, which are important ecologically and for local economies. Most of the ecoregion is dominated by coniferous forests. Large forest fires are very infrequent but are severe when they occur. For example, the Tillamook Burn, which is actually a series of wildfires that occurred from 1939-1951, burned approximately 350,000 acres. The Coast Range includes the highest density of streams found in the state, and deciduous riparian vegetation is distinct from surrounding coniferous forests. Along the coastal strip, habitats are influenced by the marine environment and include beaches, estuaries, and headlands.

Some towns in Oregon's Coast Range ecoregion include: Tillamook, Yachats, Astoria, Bandon, Cannon Beach, Elkton, Florence, Gold Beach, Lincoln City, Newport, and Waldport. The largest urban area on the coast is in Coos Bay/North Bend. Because of the bay and the Coos River, this area is a hub for fishing, shellfish, forest products, and transportation. Forestry remains the primary industry in the interior portion of the ecoregion. The Oregon coast offers excellent recreational opportunities, and tourism is important to local communities. Fishing, both commercial and recreational, and fish processing are

significant components of the economy. People are increasingly moving to the coast to retire, so retirement services are growing in importance to coastal communities.

## CHARACTERISTICS



### Important Industries

Timber, agriculture, commercial fishing, fish processing, tourism and recreation, and retirement services



## Major Crops

Livestock forage, beef and dairy cattle

## Important Nature-based Recreational Areas

Coos Bay; Tillamook Bay; Oregon sand dunes; Siuslaw and Siskiyou National Forests; Clatsop, Elliot, and Tillamook State Forests; Oregon Dunes National Recreation Area; numerous state parks and waysides

## Elevation

From 0 to 4,100 feet

## Important Rivers

Alea, Chetco, Coos, Coquille, Illinois, Lewis and Clark, Necanicum, Nehalem, Nestucca, Rogue, Siletz, Siuslaw, Trask, Umpqua, Wilson, Yaquina, Youngs

## CONSERVATION ISSUES AND PRIORITIES

Demand for waterfront property is increasing, along with numbers of people recreating, relocating, and retiring along the Oregon coast. Careful resource planning helps to balance these increasing demands with maintaining coastal fish, wildlife, and habitats. Coordinated, broad-scale planning is especially important given the diversity of the Coast Range ecoregion. For example, the Northwest Forest Plan covers much of the region's forests. However, the adaptive management component of the [Northwest Forest Plan](#) has not been fully implemented. Although many plans currently exist, there is a continuing need to consider the unique requirements of transitional zones such as estuaries, and to integrate marine and inland conservation planning.

Much of the ecoregion is publicly owned and managed to balance recreation, tourism, and conservation. However, ownership in the northern part of the ecoregion is particularly fragmented. Restoration of watershed processes and functions, and restoration of habitat complexity (e.g., woody debris) to stream and [riparian areas](#), are major concerns throughout the entire Coast Range ecoregion. Restoring flows to headwater streams maintains ecological connections important for many species.

[Key Conservation Issues](#) of particular concern in the Coast Range ecoregion include [Land Use Changes](#) and [Invasive Species](#). In addition to the statewide issues, oil spills, loss of estuarine habitat, and recreational use are of particular concern in this ecoregion.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

Land Use Conversion and Urbanization

Some areas of the Coast Range are developing rapidly, especially along the coastline. Steep slopes limit the amount of land available for development, and concentrate it in sensitive areas, such as near rivers and estuaries. Residential development contributes to habitat loss and can threaten traditional land uses, such as agriculture and forestry.

#### **Recommended Approach**

Work with community leaders and agency partners to encourage planned, efficient growth. Support existing [land use regulations](#) to preserve farmland and forestland, open spaces, recreation areas, wildlife refuges, and natural habitats. Provide outreach about the benefits of wetland and tideland restoration.

#### **Limiting Factor:**

##### Oil Spills

Oil spills along the coast can have devastating effects on coastal habitat, fish, and wildlife. Tidal flux can spread oil or other hazardous materials around sensitive habitats very quickly. Therefore, rapid response in the event of a spill is essential. Additionally, spills of hazardous materials or oil from vehicles traveling on roads along the coast could potentially impact nearby rivers and aquatic species.

#### **Recommended Approach**

Ensure rapid response and preparedness for spills of hazardous substances. Oregon Department of Environmental Quality's (DEQ) [Marine Oil Spill Prevention Program](#) and the Pacific States/British Columbia [Oil Spill Task Force](#) work with multiple parties and interested partners to address these concerns and quickly identify appropriate actions.

#### **Limiting Factor:**

##### Alterations to Estuarine and Wetland Habitats

Coastal rivers, [wetlands](#), and [estuaries](#) were altered long ago when side channels were diked, marshes drained, and channels deepened. These changes impacted fish and wildlife dependent on estuarine habitats.

#### **Recommended Approach**

Where possible, remove dikes and tide gates to restore estuarine habitats. Where tide gates need to be retained, replace older gates with new innovations, such as side-hinged and aluminum gates that improve fish passage and hydrologic functions.

**Limiting Factor:**

## Increasing Recreational Use

Recreation contributes positively to the Coast Range's economy and local communities and is managed carefully in many areas. However, increasing numbers of recreationists can impact sensitive areas, such as shorebird nesting areas and tidepool habitats. There are concerns with off-leash dogs and uncontrolled OHV use in some areas. OHV use and target shooting recreation are increasing on public forestlands, especially just outside of major metropolitan areas. As more land is closed to the public during fire seasons, remaining lands (particularly public lands) are experiencing greater use.

**Recommended Approach**

Work with state and federal forest management agencies to plan recreational use and to increase education and outreach for recreationists and associated businesses. Where needed, direct activities to particular seasons or away from sensitive areas. Monitor to ensure that OHV rules for use and public lands motor vehicle use maps are enforced by the managing agencies. Improve public awareness of sensitive areas through signage and kiosks.

**Limiting Factor:**

## Invasive Species

Non-native plant and animal invasions disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands and waters.

**Recommended Approach**

Emphasize prevention, risk assessment, early detection, and quick control to prevent new **invasive species** from becoming fully established. Prioritize management and control efforts to focus on key invasive species in high priority areas, particularly where **Strategy Habitats** and **Strategy Species** occur. Where needed, use multiple site-appropriate tools (e.g., mechanical, chemical, and biological) to control the most damaging invasive species. Work with partners to implement measures to prevent unintentional introduction of non-native species (e.g., implement existing ballast water treatment regulations). Provide information to the public about the ecological and economic damage that invasive species cause.

**STRATEGY SPECIES**

American Marten (*Martes americana*)

Black Brant (*Branta bernicla nigricans*)

Black Petaltail (*Tanypteryx hageni*)

California Mountain Kingsnake (*Lampropeltis zonata*)

California Myotis (*Myotis californicus*)

Cascade Head Catchfly (*Silene douglasii* var. *oraria*)  
Caspian Tern (*Hydroprogne caspia*)  
Chum Salmon, Coastal SMU (*Oncorhynchus keta*)  
Chum Salmon, Lower Columbia SMU (*Oncorhynchus keta*)  
Clouded Salamander (*Aneides ferreus*)  
Coast Range Fawn Lily (*Erythronium elegans*)  
Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*)  
Coastal Tailed Frog (*Ascaphus truei*)  
Coho Salmon, Coastal SMU (*Oncorhynchus kisutch*)  
Coho Salmon, Lower Columbia SMU (*Oncorhynchus kisutch*)  
Coho Salmon, Rogue SMU (*Oncorhynchus kisutch*)  
Columbia Torrent Salamander (*Rhyacotriton kezeri*)  
Columbian White-tailed Deer (*Odocoileus virginianus leucurus*)  
Cope's Giant Salamander (*Dicamptodon copei*)  
Del Norte Salamander (*Plethodon elongatus*)  
Eulachon (*Thaleichthys pacificus*)  
Fall Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)  
Fisher (*Pekania pennanti*)  
Foothill Yellow-legged Frog (*Rana boylei*)  
Fringed Myotis (*Myotis thysanodes*)  
Green Sturgeon, Northern DPS (*Acipenser medirostris*)  
Green Sturgeon, Southern DPS (*Acipenser medirostris*)  
Harlequin Duck (*Histrionicus histrionicus*)  
Hoary Bat (*Lasiurus cinereus*)  
Hoary Elfin Butterfly (*Incisalia polia maritima*)  
Insular Blue Butterfly (*Plebejus saepiolus littoralis*)  
Long-legged Myotis (*Myotis volans*)  
Marbled Murrelet (*Brachyramphus marmoratus*)  
Millicoma Dace (*Rhinichthys cataractae* ssp)  
Monarch Butterfly (*Danaus plexippus*)  
Nelson's Checkermallow (*Sidalcea nelsoniana*)  
Northern Red-legged Frog (*Rana aurora*)  
Northern Spotted Owl (*Strix occidentalis caurina*)  
Olive-sided Flycatcher (*Contopus cooperi*)  
Oregon Silverspot Butterfly (*Speyeria zerene hippolyta*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Pacific Walker (*Pomatiopsis californica*)  
Peregrine Falcon (*Falco peregrinus anatum*)  
Pink Sandverbena (*Abronia umbellata* var. *breviflora*)  
Point Reyes Bird's-beak (*Cordylanthus maritimus* ssp. *palustris*)

Purple Martin (*Progne subis arboricola*)  
Red Tree Vole (*Arborimus longicaudus*)  
Ringtail (*Bassariscus astutus*)  
Robust Walker (*Pomatiopsis binneyi*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Silvery Phacelia (*Phacelia argentea*)  
Sisters Hesperian (*Hochbergellus hirsutus*)  
Southern Torrent Salamander (*Rhyacotriton variegatus*)  
Spring Chinook Salmon, Coastal SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Rogue SMU (*Oncorhynchus tshawytscha*)  
Summer Steelhead / Coastal Rainbow Trout, Coastal SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Summer Steelhead / Coastal Rainbow Trout, Lower Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Summer Steelhead / Coastal Rainbow Trout, Rogue SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Tufted Puffin (*Fratercula cirrhata*)  
Umpqua Chub (*Oregonichthys kalawatseti*)  
Western Brook Lamprey (*Lampetra richardsoni*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Lily (*Lilium occidentale*)  
Western Painted Turtle (*Chrysemys picta bellii*)  
Western Pond Turtle (*Actinemys marmorata*)  
Western Ridged Mussel (*Gonidea angulata*)  
Western River Lamprey (*Lampetra ayresii*)  
Western Snowy Plover (*Charadrius nivosus nivosus*)  
Western Toad (*Anaxyrus boreas*)  
Winter Steelhead / Coastal Rainbow Trout, Lower Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Wolf's Evening Primrose (*Oenothera wolfii*)

## CONSERVATION OPPORTUNITY AREAS

Alsea Estuary-Alsea River [COA ID: 029]  
Beaver Creek [COA ID: 027]  
Cape Ferrello [COA ID: 051]  
Chetco River-Winhchuck River Estuaries [COA ID: 052]  
Clatskanie River [COA ID: 008]  
Clatsop Plains [COA ID: 001]

Clatsop State Forest-Jewel Meadows Area [COA ID: 007]  
Columbia River-Blind Slough Swamp [COA ID: 006]  
Coos Bay [COA ID: 043]  
Coos Mountain-Middle Creek [COA ID: 044]  
Deer Island [COA ID: 053]  
Depoe Bay Area [COA ID: 023]  
Devil's Lake [COA ID: 020]  
Elliot State Forest [COA ID: 041]  
Forest Park [COA ID: 058]  
Gales Creek [COA ID: 013]  
Heceta Head [COA ID: 031]  
Kalmiopsis Area [COA ID: 100]  
Kings Valley-Woods Creek Oak Woodlands [COA ID: 080]  
Lower Coquille River [COA ID: 045]  
Lower Rogue River and Estuary [COA ID: 049]  
Lower Willamette River Floodplain [COA ID: 059]  
Luckiamute River and Tributaries [COA ID: 075]  
Mary's Peak [COA ID: 028]  
McTimmons Valley – Airlie Savanna [COA ID: 076]  
Mill Creek [COA ID: 024]  
Necanicum Estuary [COA ID: 002]  
Necanicum River [COA ID: 004]  
Nehalem and Salmonberry River Headwaters [COA ID: 012]  
Nehalem River Estuary [COA ID: 009]  
Nestucca Bay [COA ID: 016]  
Nestucca River Watershed [COA ID: 017]  
Netarts Bay [COA ID: 014]  
New River Area [COA ID: 047]  
North Fork Nehalem River [COA ID: 010]  
North Fork Siuslaw River [COA ID: 032]  
North Fork Smith River [COA ID: 037]  
Pistol River Estuary [COA ID: 050]  
Red Prairie-Mill Creek-Willamina Oaks South [COA ID: 071]  
Rickreall Creek and Little Luckiamute River Headwaters [COA ID: 025]  
Rogue River [COA ID: 093]  
Saddle Mountain [COA ID: 005]  
Salmon River Estuary-Cascade Head [COA ID: 019]  
Sand Lake Area [COA ID: 015]  
Sauvie Island-Scappoose [COA ID: 054]  
Scoggins Valley-Mount Richmond [COA ID: 063]

Siletz Bay [COA ID: 021]  
Siletz River [COA ID: 022]  
Siuslaw River [COA ID: 035]  
Siuslaw River Estuary [COA ID: 034]  
Sixes River-Elk River [COA ID: 048]  
South Fork Coquille [COA ID: 046]  
Sutton Lake Area [COA ID: 033]  
Tahkenitch-Siltcoos Lakes [COA ID: 036]  
Tenmile Lake [COA ID: 040]  
Tillamook Bay and Tributaries [COA ID: 011]  
Tillamook Head [COA ID: 003]  
Trask Mountain [COA ID: 018]  
Umpqua River [COA ID: 042]  
Umpqua River Estuary [COA ID: 038]  
Upper Siuslaw [COA ID: 089]  
Wassen Creek [COA ID: 039]  
West Eugene Area [COA ID: 086]  
Yachats River Area [COA ID: 030]  
Yamhill Oaks-Willamina Oaks North [COA ID: 067]  
Yaquina Bay [COA ID: 026]



*Photo Credit: Steve Cherry, ODFW*

## COLUMBIA PLATEAU

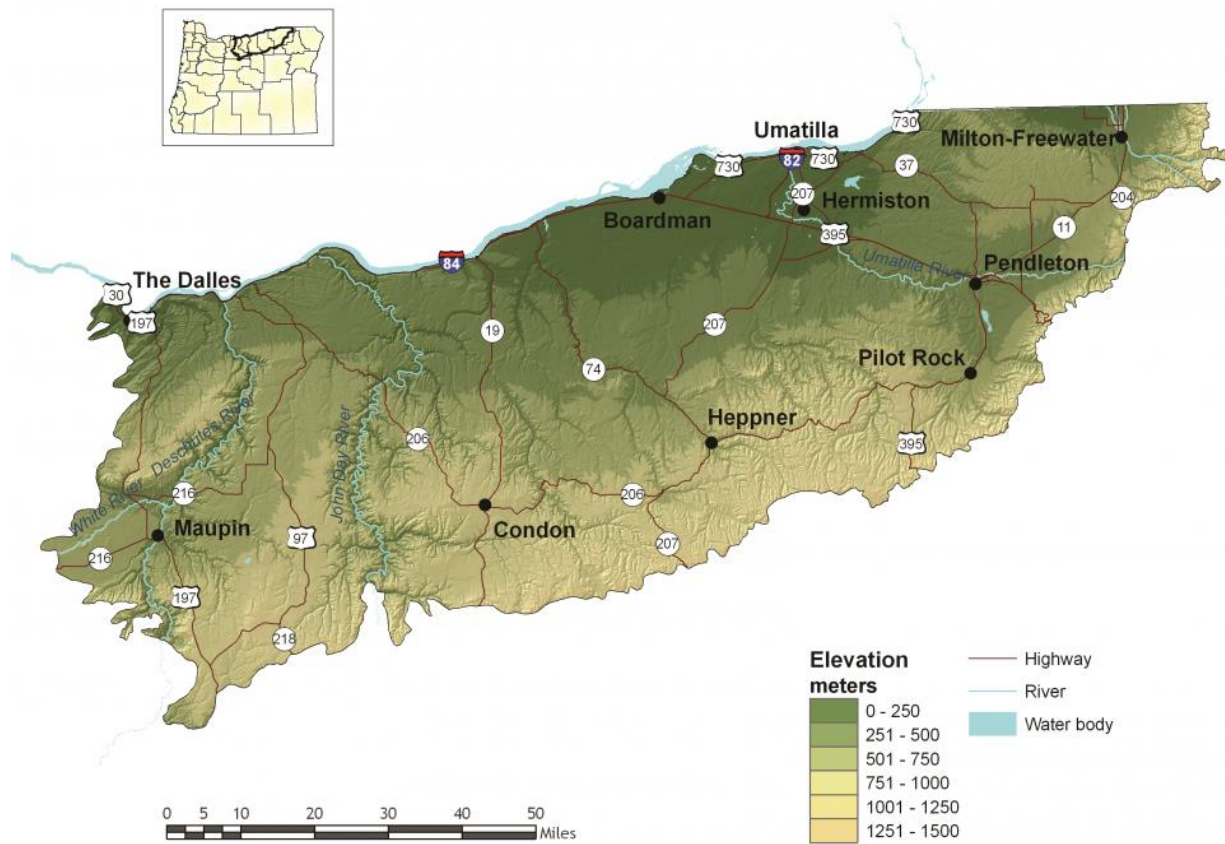
### DESCRIPTION

The Oregon portion of the Columbia Plateau ecoregion extends from the eastern slopes of the Cascade Mountains to the Blue Mountains ecoregion. Millions of years ago, the region was covered by lava flows up to 2 miles deep. The [Columbia River](#) delineates the northern border of the ecoregion in Oregon, and has greatly influenced the surrounding area with cataclysmic floods and large deposits of wind-borne silt and sand. Over time, winds scoured the floodplain, depositing silt and sand across the landscape and creating ideal conditions for agriculture: rolling lands, deep soil, and plentiful flowing rivers including the Deschutes and John Day. The ecoregion is made up entirely of lowlands, with an arid climate, cool winters, and hot summers.

The Columbia Plateau produces the vast majority of Oregon's grain, and grain production is the heart of the agricultural economy. The Columbia Plateau produces the second-highest agricultural sales per year for any ecoregion in Oregon. More than 80 percent of the ecoregion's population and employment is located in Umatilla County, which includes the cities of Pendleton and Hermiston. Other population centers include The Dalles, Condon, and Heppner.



## CHARACTERISTICS



### Important Industries

Agriculture, mobile home production, cattle, retail and services, construction

### Major Crops

Grain, barley, potatoes, onions, fruit

### Important Nature-based Recreational Areas

Cold Springs National Wildlife Refuge (NWR), Umatilla NWR, the canyons of the lower Deschutes and John Day Rivers

### Elevation

100 feet (The Dalles) to 3,000 feet (northern slopes)

## Important Rivers

Columbia, Deschutes, John Day, Umatilla, Walla Walla

## CONSERVATION ISSUES AND PRIORITIES

Almost all of the Columbia Plateau ecoregion is privately owned. Conservation opportunities for native vegetation are limited because it is difficult to maintain connectivity among high quality habitat patches.

Water availability is a concern in this ecoregion, and demands for water include agricultural, irrigation, and domestic use. Water quality in the Columbia Plateau ecoregion is affected by these demands, particularly in summer months when flows are reduced. Restoring flow to headwater streams is essential to maintain ecological connections. Maintaining aquifers is also critical.

**Key Conservation Issues** of particular concern in this ecoregion include **Water Quality and Quantity** and **Invasive Species**. In addition to the statewide issues, soil erosion, habitat fragmentation, and large-scale **energy development** are of conservation concern in this ecoregion.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

Water Availability

**Water quantity** is a limiting factor for fish, wildlife, and livestock. In streams, seasonal low flows can limit habitat suitability and reproductive success for many fish and wildlife species. As the demand for water increases, the supply of groundwater is decreasing. Water quality can also limit species and habitats.

### Recommended Approach

Provide incentives and information about water usage and sharing during low flow conditions (e.g., late summer). Increase awareness and manage timing of applications of potential aquatic contaminants. Improve compliance with water quality standards and pesticide use labels administered by the **DEQ** and **EPA**. Work on implementing **Senate Bill 1010** (Oregon Department of Agriculture) and **DEQ Total Maximum Daily Load** water quality plans.

### Limiting Factor:

Soil Erosion

Soil loss through erosion and decreases in soil quality jeopardize the productivity of native habitats and agricultural lands. Water infiltration, which is essential for productive habitats and groundwater

recharge, decreases on bare land soils. Sandy soils along the Columbia River are particularly susceptible to erosion from high winds.

### **Recommended Approach**

Use incentives to promote no-till farming and agricultural practices that do not allow lands to lay bare for long periods of time. Encourage participation and support for programs such as the Natural Resources Conservation Service's [Conservation Reserve Program](#), which promote practices that can offset or minimize soil erosion and degradation.

### **Limiting Factor:**

Habitat Fragmentation

The remaining [Strategy Habitats](#) for at-risk native plant and animal species are limited and largely confined to small and often isolated fragments, such as roadsides and sloughs. These remaining parcels have potential to be converted to agriculture, and there are few opportunities for large-scale protection or restoration of native landscapes. Existing land use and land ownership patterns present challenges to large-scale ecosystem restoration.

### **Recommended Approach**

Provide incentives (e.g., financial assistance, conservation easements) and information about the benefits of maintaining bird and other wildlife habitat. Broad-scale conservation strategies will need to focus on restoring and maintaining more natural ecosystem processes and functions within a landscape that is managed primarily for other values. This may include an emphasis on more “conservation-friendly” management techniques for existing land uses, and restoration of some key ecosystem components such as [riparian](#) function. “Fine-filter” conservation strategies that focus on needs of individual [Strategy Species](#) and key sites are particularly important in this ecoregion. Because approximately 84 percent of the Columbia Plateau ecoregion is privately-owned, voluntary cooperative approaches are the key to long-term conservation using tools such as financial incentives, regulatory assurance agreements, and conservation easements. Where appropriate, plan development carefully to maintain existing native habitats.

### **Limiting Factor:**

Invasive Species

Invasive plant and animal species disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands including farmland and rangeland. Differences in county policies and funding availability regarding invasive species have resulted in some inconsistencies in approach.

## Recommended Approach

Emphasize prevention, risk assessment, early detection, and quick control to prevent new **invasive species** from becoming fully established. Use multiple site-appropriate tools (e.g., mechanical, chemical and biological) to control the most damaging invasive species. Focus on key invasive species in high priority areas, particularly where **Strategy Habitats** and **Strategy Species** occur. Ensure cooperation and collaboration between counties, landowners, land managers, and other entities with invasive species policies and interests. Promote the use of native species for restoration and revegetation.

### Limiting Factor:

#### Energy Development

Climate change and global economies are increasing pressure for renewable energy development, including wind and geothermal energy. Energy projects offer environmental benefits but also have impacts on fish, wildlife, and their habitats. Wind energy potential is especially high in the Columbia Plateau. The area is increasingly challenged with the need to balance the state's interest in clean energy development with local natural resource conservation needs.

## Recommended Approach

Plan energy projects carefully, using best available information and consultation with biologists. See the Key Conservation Issue on **Land Use Changes** and the **Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines**.

## STRATEGY SPECIES

Brewer's Sparrow (*Spizella breweri breweri*)  
Bulb Juga (*Juga bulbosa*)  
Bull Trout, John Day SMU (*Salvelinus confluentus*)  
Bull Trout, Umatilla SMU (*Salvelinus confluentus*)  
Burrowing Owl (*Athene cunicularia hypugaea*)  
California Mountain Kingsnake (*Lampropeltis zonata*)  
Common Nighthawk (*Chordeiles minor*)  
Dalles Mountainsnail (*Oreohelix variabilis variabilis*)  
Fall Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Ferruginous Hawk (*Buteo regalis*)  
Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)  
Hoary Bat (*Lasiurus cinereus*)  
Lawrence's Milkvetch (*Astragalus collinus* var. *laurentii*)  
Lewis's Woodpecker (*Melanerpes lewis*)  
Loggerhead Shrike (*Lanius ludovicianus*)

Long-billed Curlew (*Numenius americanus*)  
Monarch Butterfly (*Danaus plexippus*)  
Northern Sagebrush Lizard (*Sceloporus graciosus graciosus*)  
Northern Wormwood (*Artemisia campestris* var. *wormskioldii*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Pallid Bat (*Antrozous pallidus*)  
Purple-lipped Juba (*Juba hemphilli maupinensis*)  
Sagebrush Sparrow (*Artemisiospiza nevadensis*)  
Shortface Lanx (*Fisherola nuttalli*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Spotted Bat (*Euderma maculatum*)  
Spring Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Summer Steelhead / Columbia Basin Redband Trout, Mid Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss gairdneri*)  
Swainson's Hawk (*Buteo swainsoni*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Tygh Valley Milkvetch (*Astragalus tyghensis*)  
Washington Ground Squirrel (*Urocitellus washingtoni*)  
Western Brook Lamprey (*Lampetra richardsoni*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Painted Turtle (*Chrysemys picta bellii*)  
Western River Lamprey (*Lampetra ayresii*)  
Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)

## CONSERVATION OPPORTUNITY AREAS

Bakeoven Creek-Buckhollow Creek [COA ID: 151]  
Boardman Area [COA ID: 154]  
Cold Springs National Wildlife Refuge Area [COA ID: 156]  
Deschutes River [COA ID: 149]  
Fifteenmile Creek [COA ID: 147]  
Lawrence Grasslands [COA ID: 152]  
Lower Deschutes River [COA ID: 148]  
Lower John Day River [COA ID: 153]  
Metolius Bench-Mutton Mountains Wildlife Movement Corridor [COA ID: 150]  
Rock Creek-Butter Creek Grasslands [COA ID: 155]  
Walla Walla Headwaters [COA ID: 157]  
Wasco Oaks [COA ID: 125]



*Photo Credit: William Tinniswood, ODFW*

## EAST CASCADES

### DESCRIPTION

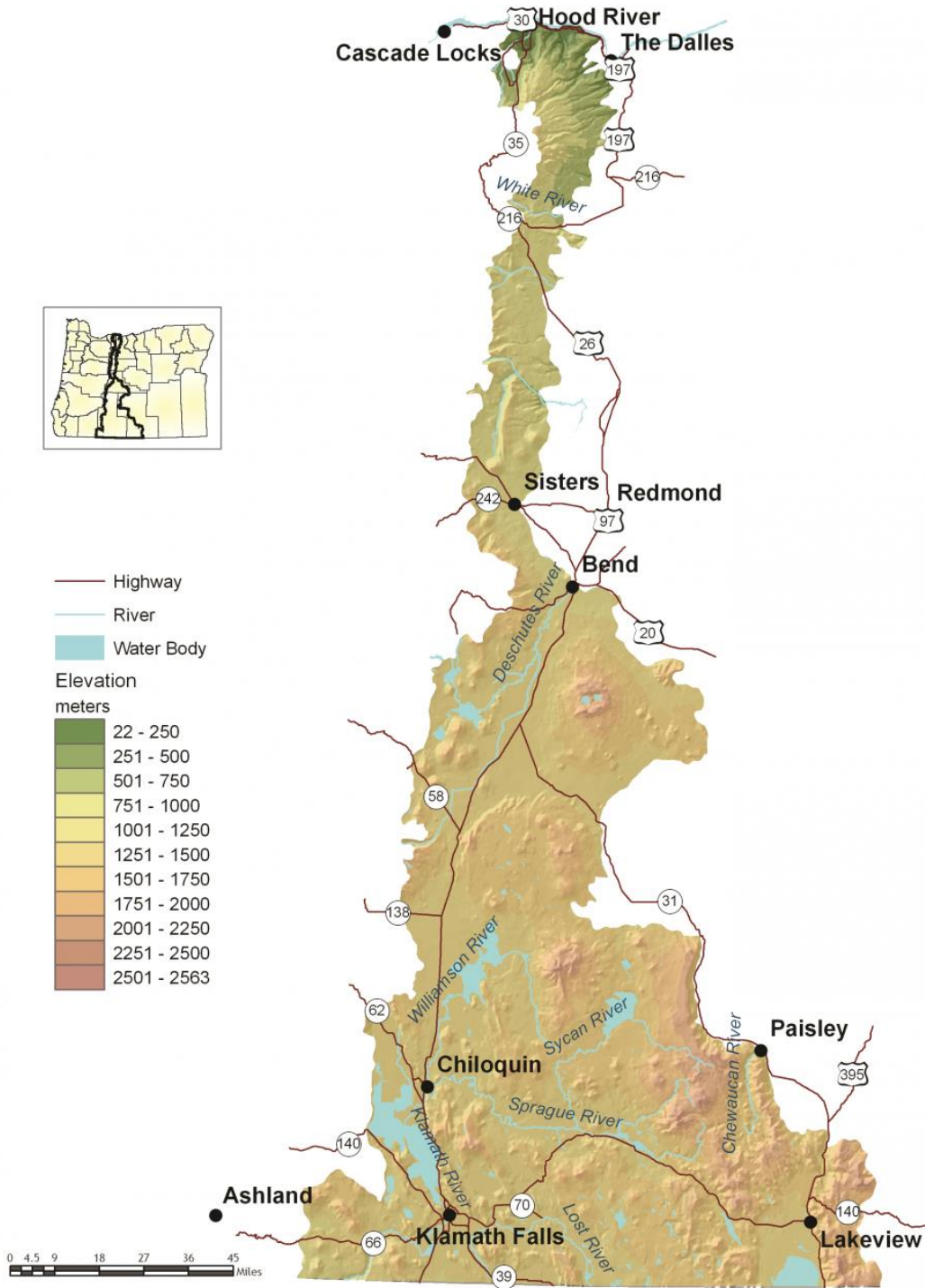
The East Cascades ecoregion extends from just east of the Cascade Mountains' summit to the warmer, drier high desert to the east. Stretching the full north-to-south length of the state, the East Cascades is narrow at the Columbia River but becomes wider toward the California border. This ecoregion varies dramatically from its cool, moist border with the West Cascades ecoregion to its dry eastern border with the Northern Basin and Range ecoregion. The climate is generally dry, with wide variations in temperature. The East Cascades ecoregion includes several peaks and ridges in the 6,000-7,000 foot range, but overall the slopes on the east side of the Cascade Mountain Range are less steep and cut by fewer streams than the West Cascades ecoregion. The East Cascades' volcanic history is evident through numerous buttes, lava flows, craters, and lava caves, and in the extensive deep ash deposits created by the explosion of historical Mt. Mazama during the creation of Crater Lake.

The terrain ranges from forested uplands to marshes and agricultural fields at lower elevations. The northern two-thirds of the East Cascades ecoregion is drained by the Deschutes River, ultimately flowing into the Columbia River. Most of the southern portion of the East Cascades ecoregion is drained by the Klamath River, with a small portion draining into Goose Lake, a closed basin. In general, the East Cascades is drier than the West Cascades, with fewer rivers flowing over the mountain slopes. However, the East Cascades is characterized by many lakes, reservoirs, and marshes, providing exceptional habitat for aquatic species and wildlife closely associated with water, including waterbirds, amphibians, fish, aquatic plants, and aquatic invertebrates. In fact, the East Cascades ecoregion supports some of the most remarkable biological diversity in the world.

When compared to Oregon's other ecoregions, the East Cascades has the second-highest average income (the Willamette Valley ecoregion supports the highest per-capita income). Much of this income is related to tourism and recreation, but forestry and agriculture also provide important roles. Towns include Bend, Klamath Falls, Lakeview, and Hood River; many of these towns are experiencing rapid

population growth. Most of the Warm Springs Indian Reservation is found in the East Cascades ecoregion.

## CHARACTERISTICS



### **Important Industries**

Recreation (tourism and hospitality), lumber and wood, agriculture

### **Major Crops**

Fruit (Hood River Valley), wood, potatoes, onions, barley (Klamath Basin), alfalfa, and cattle (Lake County)

### **Important Nature-based Recreational Areas**

Klamath Marsh, Goose Lake, Newberry Crater National Monument, high Cascade lakes along Century Drive, Pine Mountain, Warner Mountains, Wilderness Areas (Gearhart, Badger Creek), Metolius and Deschutes sub-basins

### **Elevation**

70 feet (in the Columbia River Gorge area) to over 7,700 feet (peaks in the eastern portion of the ecoregion)

### **Important Rivers**

Deschutes, Hood, Klamath, Metolius, Link, Williamson, Sycan, and Sprague

## **CONSERVATION ISSUES AND PRIORITIES**

Habitats of the East Cascades ecoregion present much variation, from sagebrush flats to alpine fields. The conservation issues are similarly diverse as well as complex. Timber harvest practices, grazing, and fire suppression have altered the distribution and structure of much of the ecoregion's historical ponderosa pine forests and oak woodlands, and many riparian and [wetland](#) habitats have been degraded. Rapidly expanding urban and rural residential development is another major emerging conservation issue, resulting in development within riparian zones, the loss of big game winter range, and water diversions to support development. Along with this development, [Highway 97](#) traffic volume continues to increase, creating a major barrier to wildlife movement. Lastly, a high percentage of wetlands have been converted in the Klamath Basin, and water continues to be a complex and challenging issue in the area.

[Key Conservation Issues](#) of particular concern in the East Cascades ecoregion include [Invasive Species](#), [Disruption of Disturbance Regimes](#), [Water Quality and Quantity](#), and [Land Use Changes](#). In addition to the statewide issues, habitat fragmentation and increasing recreational use are of concern in this ecoregion.



## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

#### Altered Fire Regimes

Past forest practices and fire suppression have resulted in young, dense mixed-species stands where open, park-like stands of ponderosa pine once dominated. These mixed conifer forests are at increased risk of forest-destroying crown fires, disease, and damage by insects. Shading from encroaching trees and fire suppression has reduced the vigor of shrubs, particularly bitterbrush, an important forage plant for mule deer. Efforts to reduce fire danger and improve forest health may help to restore habitats but require careful planning to provide sufficient habitat features that are important to wildlife (e.g., snags, downed logs, hiding cover). Similarly, wildfire reforestation efforts should be carefully planned to create stands with tree diversity, understory vegetation, and natural forest openings.

Increasing residential and resort development in forested habitats makes prescribed fire difficult in some areas and increases risk of high-cost wildfires. Although many urban-interface “fire proofing” measures can be implemented with minimal effects to wildlife habitat, some poorly-planned efforts have unintentionally and unnecessarily harmed habitat.

### Recommended Approach

Use an integrated approach to forest health issues that considers historical conditions, wildlife conservation, **natural fire intervals**, and silvicultural techniques. Evaluate individual stands to determine site-appropriate actions, such as monitoring in healthy stands or thinning, mowing, and prescribed fire in at-risk stands. Where appropriate, thin smaller trees in the understory and develop markets for small-diameter trees.

Implement fuel reduction projects to reduce the risk of forest-destroying wildfires, considering site-specific conditions and goals. Fuel reduction strategies need to consider the habitat structures that are required by wildlife, such as snags and downed logs, and make an effort to maintain them at a level to sustain wood-dependent species. Design frequency and scale of prescribed fire to meet the habitat needs of desired focal species.

Monitor forest health initiatives and use adaptive management techniques to ensure efforts are meeting habitat restoration and forest-destroying fire prevention objectives with minimal impacts on wildlife.

Work with homeowners and resort operators to reduce vulnerability of properties to wildfires while maintaining habitat quality. Highlight successful, environmentally sensitive fuel management programs.

In the case of wildfires, maintain high snag densities and replant with native tree, shrub, grass, and forb species. Manage reforestation after wildfire to create species and structural diversity, based on local management goals.

**Limiting Factor:**

Land Use Conversion and Urbanization

The East Cascades ecoregion includes some of the fastest growing areas of the state (e.g., Bend, Klamath Falls, Hood River). Rapid urban and rural residential development contributes to habitat loss, and can threaten traditional land uses, such as agriculture and forestry. Urban and rural residential development can also fragment habitat into small patches, isolating wildlife populations. Increasing traffic volumes and road density associated with development creates barriers to animal movements, especially along Highway 97. Residential development is increasing in sensitive habitats, such as wetlands, riparian areas, and close to cliffs and rims where raptors nest.

**Recommended Approach**

Cooperative approaches with both large and small private landowners are critical. Work with community leaders and agency partners to encourage planned, efficient growth. Support existing land use regulations to preserve forestland, farmland, rangeland, open spaces, recreation areas, wildlife refuges, and natural habitats. Work with community leaders and agency partners to identify wildlife movement corridors and to fund and implement site-appropriate mitigation measures such as drift fences to overpasses or underpasses. In forested habitats, maintain vegetation to provide screening along open roads, prioritize roads for closure based on transportation needs and wildlife goals, and/or manage road use during critical periods.

**Limiting Factor:**

Habitat Fragmentation

In non-forested areas, habitats for at-risk native plants and some animal species are largely confined to small and often isolated fragments, such as roadsides and sloughs. Opportunities for large-scale protection or restoration of native landscapes are limited, particularly in the Klamath Basin. Existing land use and land ownership patterns present challenges to large-scale ecosystem restoration.

**Recommended Approach**

Broad-scale conservation strategies will need to focus on restoring and maintaining natural ecosystem processes and functions within a landscape that is increasingly managed for other values. This may include an emphasis on more “conservation-friendly” management techniques for existing land uses and restoration of some key ecosystem components such as riparian function.

**Limiting Factor:**

## Invasive Species

Non-native plant and animal invasions disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands.

**Recommended Approach**

Emphasize prevention, risk assessment, early detection, and quick control to prevent new **invasive species** from becoming fully established. Use multiple site-appropriate tools (e.g., mechanical, chemical and biological) to control the most damaging invasive species. Prioritize efforts to focus on key invasive species in high priority areas, particularly where **Strategy Habitats** and **Strategy Species** occur. Promote the use of native species for restoration and revegetation.

**Limiting Factor:**

## Recreational Activity

Increasing demands for year-round recreational activity, including new mountain bike trails, ski lifts, and skill parks, can disturb wildlife. Ski seasons are becoming shorter, contributing to the demand for year-round recreational activity. New winter tire and headlamp technologies are allowing mountain bicyclists access to important wildlife areas that were previously undisturbed due to snow. Trail riding can now occur day or night, which can disturb wildlife during critical life stages. Rock climbing too close to cliff-nesting birds such as Golden Eagles can result in nest abandonment.

**Recommended Approach**

Plan new recreational trail systems carefully and with consideration for native wildlife and their habitats. For example, limit night riding to certain areas to minimize disturbance to wildlife, avoiding areas more sensitive to damage such as wetlands. Take advantage of abandoned or closed roads, rail lines, or previously-impacted areas for conversion into trails. Work with the land management agencies such as the USFS to designate areas as high value recreation and low habitat impact areas.

**Limiting Factor:**

## Water Distribution in Arid Areas and Wildlife Entrapment in Water Developments

In arid areas, water availability can limit animal distribution. Water developments established for cattle, deer, and elk can significantly benefit birds, bats, and small mammals. However, some types of these facilities, particularly water developments for livestock, can have unintentional hazards. These hazards include over-hanging wires that act as trip lines for **bats**, steep side walls that act as entrapments under low water conditions, or unstable perches that cause animals to fall into the water. If an escape ramp is not provided, small animals cannot escape and will drown.

## Recommended Approach

Continue current efforts to provide water for wildlife in arid areas. Continue current design of big game “guzzlers” that accommodate a variety of species, and retrofit older models where appropriate to make them compatible with newer design standards. Use and maintain [escape devices](#) on water developments where animals can become trapped. Remove obstacles that could be hazardous to wildlife from existing developments.

## STRATEGY SPECIES

American Marten (*Martes americana*)  
American Pika (*Ochotona princeps*)  
American Three-toed Woodpecker (*Picoides dorsalis*)  
American White Pelican (*Pelecanus erythrorhynchos*)  
Applegate’s Milkvetch (*Astragalus applegatei*)  
Archimedes Springsnail (*Pyrgulopsis archimedis*)  
Beller’s Ground Beetle (*Agonum belleri*)  
Black Petaltail (*Tanypteryx hageni*)  
Black-backed Woodpecker (*Picoides arcticus*)  
Bull Trout, Deschutes SMU (*Salvelinus confluentus*)  
Bull Trout, Klamath Lake SMU (*Salvelinus confluentus*)  
Bull Trout, Odell Lake SMU (*Salvelinus confluentus*)  
California Mountain Kingsnake (*Lampropeltis zonata*)  
California Myotis (*Myotis californicus*)  
Cascades Frog (*Rana cascadae*)  
Caspian Tern (*Hydroprogne caspia*)  
Coho Salmon, Klamath SMU (*Oncorhynchus kisutch*)  
Cope’s Giant Salamander (*Dicamptodon copei*)  
Crater Lake Tightcoil (*Pristiloma crateris*)  
Dall’s Ramshorn (*Vorticifex effusa dalli*)  
Fall Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Flammulated Owl (*Psiloscoops flammeolus*)  
Fringed Myotis (*Myotis thysanodes*)  
Goose Lake Sucker (*Catostomus occidentalis lacusanserinus*)  
Gray Wolf (*Canis lupus*)  
Great Basin Ramshorn (*Helisoma newberryi newberryi*)  
Great Basin Redband Trout (*Oncorhynchus mykiss newberrii*)  
Great Basin Redband Trout, Goose Lake SMU (*Oncorhynchus mykiss newberrii/stonei*)  
Great Basin Redband Trout, Upper Klamath Basin SMU (*Oncorhynchus mykiss newberrii*)  
Great Gray Owl (*Strix nebulosa*)  
Greater Sandhill Crane (*Antigone canadensis tabida*)

Highcap Lanx (*Lanx alta*)  
Hoary Bat (*Lasiurus cinereus*)  
Klamath Ramshorn (*Vorticifex klamathensis klamathensis*)  
Leona's Little Blue Butterfly (*Philotiella leona*)  
Lewis's Woodpecker (*Melanerpes lewis*)  
Lined Ramshorn (*Vorticifex effusa diagonalis*)  
Long-billed Curlew (*Numenius americanus*)  
Long-legged Myotis (*Myotis volans*)  
Lost River Sucker (*Deltistes luxatus*)  
Miller Lake Lamprey (*Entosphenus minima*)  
Modoc Sucker (*Catostomus microps*)  
Monarch Butterfly (*Danaus plexippus*)  
Northern Goshawk (*Accipiter gentilis atricapillus*)  
Northern Spotted Owl (*Strix occidentalis caurina*)  
Olive-sided Flycatcher (*Contopus cooperi*)  
Oregon Semaphore Grass (*Pleuropogon oregonus*)  
Oregon Spotted Frog (*Rana pretiosa*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Pallid Bat (*Antrozous pallidus*)  
Peck's Milkvetch (*Astragalus peckii*)  
Pit Sculpin (*Cottus pitensis*)  
Pumice Grape-fern (*Botrychium pumicola*)  
Red-necked Grebe (*Podiceps grisegena*)  
Scale Lanx (*Lanx klamathensis*)  
Scalloped Juga (*Juga acutifilosa*)  
Shortnose Sucker (*Chasmistes brevirostris*)  
Sierra Nevada Red Fox (*Vulpes vulpes necator*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Sinitzin Ramshorn (*Vorticifex klamathensis sinitzini*)  
Siskiyou Hesperian (*Vespericola sierranus*)  
Spotted Bat (*Euderma maculatum*)  
Spring Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Summer Steelhead / Columbia Basin Redband Trout, Mid Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss gairdneri*)  
Swainson's Hawk (*Buteo swainsoni*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Trumpeter Swan (*Cygnus buccinator*)  
Turban Pebblesnail (*Fluminicola turbiniformis*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Painted Turtle (*Chrysemys picta bellii*)

Western Pond Turtle (*Actinemys marmorata*)  
Western Toad (*Anaxyrus boreas*)  
White-headed Woodpecker (*Picoides albolarvatus*)  
Yellow Rail (*Coturnicops noveboracensis noveboracensis*)

## CONSERVATION OPPORTUNITY AREAS

Big Marsh Creek [COA ID: 133]  
Central Cascades Crest, Southeast [COA ID: 116]  
Chewaucan River [COA ID: 141]  
Crater Lake [COA ID: 121]  
Dry Valley [COA ID: 144]  
Gearhart Mountain-North Fork Sprague [COA ID: 140]  
Hood River [COA ID: 106]  
Klamath Marsh-Williamson River [COA ID: 134]  
Klamath River Canyon [COA ID: 142]  
Little Deschutes River [COA ID: 132]  
Long Creek-Coyote Creek-Silver Creek [COA ID: 135]  
Lost River Area [COA ID: 143]  
Metolius Bench-Mutton Mountains Wildlife Movement Corridor [COA ID: 150]  
Metolius River Area [COA ID: 127]  
Mt Hood Area [COA ID: 107]  
Newberry Crater [COA ID: 130]  
Odell Lake-Davis Lake [COA ID: 117]  
Pelican Butte-Sky Lakes Area [COA ID: 123]  
Quartz Mountain [COA ID: 131]  
Soda Mountain Area [COA ID: 124]  
Sprague River [COA ID: 139]  
Summer Lake Area [COA ID: 189]  
Sycan Marsh [COA ID: 136]  
Sycan River [COA ID: 137]  
Thomas Creek-Goose Lake [COA ID: 145]  
Upper Deschutes River [COA ID: 129]  
Upper Klamath Lake Area [COA ID: 138]  
Warm Springs River [COA ID: 126]  
Warner Mountains [COA ID: 146]  
Wasco Oaks [COA ID: 125]  
Whychus Creek [COA ID: 128]



*Photo Credit: USFS*

## KLAMATH MOUNTAINS

### DESCRIPTION

The Klamath Mountains ecoregion covers much of southwestern Oregon, including the Umpqua Mountains, Siskiyou Mountains, and interior valleys and foothills between these and the Cascade Range. The Rogue watershed has the largest population of any coastal watershed in Oregon (Jackson County, Josephine County, and a portion of Curry County). Several popular and scenic rivers run through the ecoregion, including the Umpqua, Rogue, Illinois, and Applegate rivers. Many salmon and steelhead make their homes in these rivers. Even though many streams in the Rogue sub-basin dry up naturally in summer, the streams are still used for spawning by salmon and steelhead at other times of the year.

Within the ecoregion, there are wide ranges in elevation, topography, geology, and climate. The elevation ranges from about 600 to more than 7,400 feet, from steep mountains and canyons to gentle foothills and flat valley bottoms. This variation, along with the varied marine influence, supports a climate that ranges from the lush, rainy western portion of the ecoregion to the dry, warmer interior valleys and cold, snowy mountains.

Unlike other parts of Oregon, the landscape of the Klamath Mountains ecoregion has not been significantly shaped by volcanism. The geology of the Klamath Mountains can be better described as a mosaic rather than the layer-cake geology of most of the rest of the state. In the Klamath Mountains, serpentine mineral bedrock has weathered to a soil rich in heavy metals, including chromium, nickel, and gold, and in other parts, mineral deposits have crystallized in fractures. In fact, mining was the first major resource use of the ecoregion, and Jacksonville was Oregon's most classic "gold rush" town.

Partly because of this unique geology, the Klamath Mountains ecoregion boasts a high rate of species diversity, including many species found only locally. In fact, the Klamath-Siskiyou region was included in the World Wildlife Fund's assessment of the 200 locations most important for species diversity world-wide. The area is also proposed as a World Heritage Site and UNESCO Biosphere Reserve. The region is particularly rich in plant species, including many pockets of endemic communities and some of the most

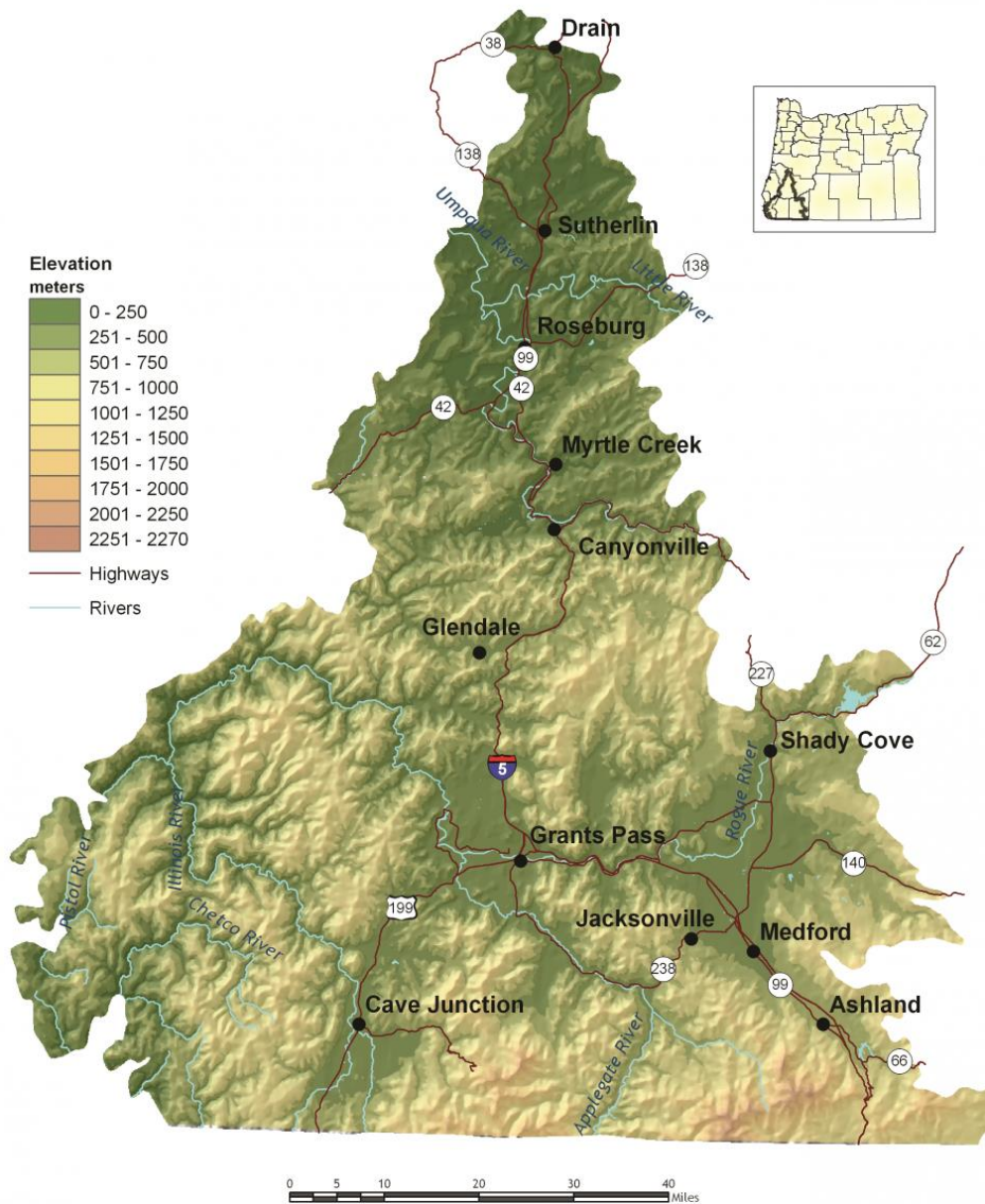
diverse plant communities in the world. For example, there are more kinds of cone-bearing trees found in the Klamath Mountains ecoregion than anywhere else in North America. In all, there are about 4,000 native plants in Oregon, and about half of these are found in the Klamath Mountains ecoregion. The ecoregion is noted as an Area of Global Botanical Significance (one of only seven in North America) and World Center of Plant Diversity by the World Conservation Union. The ecoregion also boasts many unique invertebrates, although many of these are not as well studied as their plant counterparts.

In June 2000, President Clinton established the Cascade-Siskiyou National Monument, which encompasses 86,774 acres of forest and grassland. This National Monument is the first U.S. National Monument set aside solely for the preservation of biodiversity. The United States Congress designated the Soda Mountain Wilderness in 2009, which now has over 24,700 acres. All of this wilderness is managed by the Bureau of Land Management (BLM).

While panning for gold first drew European settlers to the Klamath Mountains ecoregion, today's communities have a wide range of industries and economies, including agriculture, manufacturing, and tourism. Many retirement communities are rapidly growing in the Medford and Roseburg areas.



## CHARACTERISTICS



### Important Industries

Lumber and wood manufacturing, service, tourism, trade, new electronics and transportation equipment manufacturers

### Major Crops

Fruit, vegetables, livestock, dairy farms, nursery products, forest products

### **Important Nature-based Recreational Areas**

Siskiyou Mountains/Siskiyou National Forest, Applegate Lake, Rogue River National Forest, Emigrant Lake, Howard Prairie Lake, Umpqua National Forest

### **Elevation**

600 feet to 7,500 feet (Mt. Ashland)

### **Important Rivers**

Applegate, Rogue, Chetco, Coquille, Umpqua, Illinois

## **CONSERVATION ISSUES AND PRIORITIES**

While the Klamath Mountains ecoregion is unique, it embodies many of the conservation issues facing other parts of Oregon. For example, increasing population growth and development in rural residential and urban communities strain resources, particularly in the southern and eastern portions of the ecoregion. The Klamath Mountains is the second fastest-growing ecoregion in Oregon (the Willamette Valley ecoregion is experiencing the fastest rate of expansion). Much of the population growth is concentrated in valleys along the Interstate 5 corridor. Demands for choice building sites often coincide with good quality habitat.

The [Northwest Forest Plan](#) covers many of the forests found in the western part of the ecoregion. However, the adaptive management component of the Northwest Forest Plan has not been fully implemented. Overall, these habitats are challenged by decades of fire suppression, a need to reduce excessive fuel loadings that have accumulated in the dry interior, and by checkerboard ownership patterns that can make resource planning particularly challenging. Grasslands in the Klamath Mountains ecoregion are home to many endemic and at-risk plant communities but are potentially impacted by invasive grasses and by conversion to development. Recent indicators suggest that water quality and riparian condition in the ecoregion may be increasing. Much of this change could be attributed to local collaborative conservation efforts via watershed councils and other groups.

[Key Conservation Issues](#) of particular concern in the Klamath Mountains ecoregion include [Land Use Changes](#), [Disruption of Disturbance Regimes](#), and [Invasive Species](#). In addition to the statewide issues, loss of habitat connectivity and mineral extraction are of concern in this ecoregion. Many unique plant and soil features are found in this ecoregion, including granitic sediments in many streambeds. These features are highly sensitive to local disturbances.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

#### Land Use Conversion and Urbanization

Rapidly expanding communities in the Klamath Mountains ecoregion include Medford and Roseburg, for example. Rapid urbanization can strain the ability of sensitive habitat, such as valleys, wetlands, and aquatic habitats, to continue to provide valued ecological functions and services. Rapid development increases the potential for conflict between people and wildlife. For example, increasing road traffic increases the potential for collisions with migrating species, creating a hazard to both motorists and wildlife.

### Recommended Approach

Cooperative approaches with private landowners are the key to long-term conservation. **Essential tools** include financial incentives, conservation easements, and informational resources. Work with community leaders and agency partners to ensure planned, efficient growth. Support and implement existing **land use regulations** to preserve farm and range land, open spaces, recreation areas, and natural habitats for wildlife. Ensure that local wildlife services are sufficiently maintained to help residents manage wildlife damage issues.

### Limiting Factor:

#### Altered Fire Regimes

Historically, the ecoregion was dominated by fire-adapted vegetation and experienced widely variable fire regimes, ranging from areas with relatively short fire return intervals to areas with greater than 50-year return intervals. Fire suppression has damaged forest health, resulting in undesirable changes in vegetation and increased intensity of wildfires as a result of increased fuel loads. Efforts to reduce fire danger can help to restore fish and wildlife habitat, but they require careful planning. Reintroducing fire can be challenging in the Klamath Mountains because of high volatility of fuels, “checkerboard” land ownership patterns, and scattered rural residential developments.

### Recommended Approach

Use an integrated approach to fuels management and forest health issues that considers historical conditions, wildlife conservation, **natural fire intervals**, and silvicultural techniques. Encourage forest management at a broad scale to address limiting factors. Reintroduce fire where feasible. Prioritize sites and applications. Maintain important wildlife habitat features, such as snags and logs, to sustain wood-dependent species. In areas where prescribed fire is undesirable or difficult to implement, use mechanical treatment methods (e.g., chipping, cutting for firewood) that minimize soil disturbance. Support fish habitat restoration by reducing stream sedimentation. Monitor these efforts and use adaptive management techniques to ensure efforts are meeting habitat restoration and wildfire

prevention objectives with minimal impacts on wildlife. Identify sub-basins with unique granitic sediment features that are especially at risk.

**Limiting Factor:**

Loss of Habitat Connectivity

The Klamath Mountains ecoregion is naturally diverse and heterogeneous. Some habitat types have been particularly disrupted by fragmentation and loss of connectivity, including late-successional forests and valley bottom habitats. Opportunities for large-scale protection or restoration of native landscapes are limited. Existing development, growth pressures, high land costs, and the fragmented nature of ownerships and remaining native habitats all present barriers to large-scale ecosystem restoration.

**Recommended Approach**

Broad-scale conservation strategies will need to focus on restoring and maintaining more natural ecosystem processes and functions within a landscape that is managed primarily for other values. This may include an emphasis on conservation-oriented management techniques for existing land uses and restoration of some key ecosystem components, such as river-floodplain connections and riparian function.

**Limiting Factor:**

Invasive Species

Invasive plants are of particular concern in the Klamath Mountains ecoregion. Invasive plants disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands. Invasive plants have been on the increase for the last 20 years. While not nearly as extensive as invasive plants, non-native animals have also impacted native fish and wildlife populations.

**Recommended Approach**

Emphasize prevention, risk assessment, early detection, and quick control to prevent new invasive species from becoming fully established. Use multiple site-appropriate tools (e.g., mechanical, chemical, and biological) to control the most damaging invasive species. Prioritize efforts to focus on key invasive species in high priority areas, particularly where Strategy Habitats and Strategy Species occur. Cooperate with partners through habitat programs and county weed boards to address invasive species problems. Promote the use of native species for restoration and revegetation.

**Limiting Factor:**

Mineral Extraction

Long-term effects of historical mining include damage to stream beds and toxic runoff. Currently, mining for nickel and chromium associated with the region's serpentine soils has the potential to impact fish and wildlife by disturbing habitat. Mineral extraction is a particular concern in the Siskiyou Mountains. Gold mining also potentially impacts habitat for fish, wildlife, and at-risk plants along many streams. In-stream placer mining and recreational placer mining are prevalent in this ecoregion.

### **Recommended Approach**

Plan mineral extraction activities to minimize potential impact on Strategy Species and Habitats. Minimize disturbance by focusing extraction efforts in areas with existing roads, rather than creating new roads and increasing the potential for habitat disturbance. Follow existing recommendations to avoid impacting water quality and riparian function.

## **STRATEGY SPECIES**

Acorn Woodpecker (*Melanerpes formicivorus*)  
American Marten (*Martes americana*)  
Big-flowered Woolly Meadowfoam (*Limnanthes floccosa* ssp. *grandiflora*)  
California Mountain Kingsnake (*Lampropeltis zonata*)  
California Myotis (*Myotis californicus*)  
Clouded Salamander (*Aneides ferreus*)  
Coastal Tailed Frog (*Ascaphus truei*)  
Coho Salmon, Klamath SMU (*Oncorhynchus kisutch*)  
Coho Salmon, Rogue SMU (*Oncorhynchus kisutch*)  
Common Nighthawk (*Chordeiles minor*)  
Cook's Desert Parsley (*Lomatium cookii*)  
Crinite Mariposa Lily (*Calochortus coxii*)  
Del Norte Salamander (*Plethodon elongatus*)  
Dwarf Meadowfoam (*Limnanthes floccosa* ssp. *pumila*)  
Eulachon (*Thaleichthys pacificus*)  
Fisher (*Pekania pennanti*)  
Flammulated Owl (*Psiloscopus flammeolus*)  
Foothill Yellow-legged Frog (*Rana boylei*)  
Franklin's Bumble Bee (*Bombus franklini*)  
Fringed Myotis (*Myotis thysanodes*)  
Gentner's Fritillary (*Fritillaria gentneri*)  
Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)  
Gray Wolf (*Canis lupus*)  
Great Gray Owl (*Strix nebulosa*)  
Green Sturgeon, Northern DPS (*Acipenser medirostris*)  
Green Sturgeon, Southern DPS (*Acipenser medirostris*)

Hoary Bat (*Lasiurus cinereus*)  
Howell's Mariposa Lily (*Calochortus howellii*)  
Howell's Microseris (*Microseris howellii*)  
Kincaid's Lupine (*Lupinus oregonus*)  
Large-flowered Rush Lily (*Hastingsia bracteosa*)  
Lewis's Woodpecker (*Melanerpes lewis*)  
Long-legged Myotis (*Myotis volans*)  
Marbled Murrelet (*Brachyramphus marmoratus*)  
Mardon Skipper Butterfly (*Polites mardon*)  
McDonald's Rockcress (*Arabis macdonaldiana*)  
Monarch Butterfly (*Danaus plexippus*)  
Northern Red-legged Frog (*Rana aurora*)  
Northern Spotted Owl (*Strix occidentalis caurina*)  
Oregon Shoulderband (*Helminthoglypta hertleini*)  
Oregon Vesper Sparrow (*Pooecetes gramineus affinis*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Pallid Bat (*Antrozous pallidus*)  
Purple Martin (*Progne subis arboricola*)  
Red Tree Vole (*Arborimus longicaudus*)  
Ringtail (*Bassariscus astutus*)  
Rotund Lanx (*Lanx subrotunda*)  
Rough Popcornflower (*Plagiobothrys hirtus*)  
Sexton Mountain Mariposa Lily (*Calochortus indecorus*)  
Shiny-fruited Allocarya (*Plagiobothrys lamprocarpus*)  
Sierra Nevada Red Fox (*Vulpes vulpes necator*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Siskiyou Hesperian (*Vespericola sierranus*)  
Siskiyou Mountains Salamander (*Plethodon stormi*)  
Southern Torrent Salamander (*Rhyacotriton variegatus*)  
Spotted Bat (*Euderma maculatum*)  
Spring Chinook Salmon, Coastal SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Rogue SMU (*Oncorhynchus tshawytscha*)  
Summer Steelhead / Coastal Rainbow Trout, Coastal SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Summer Steelhead / Coastal Rainbow Trout, Rogue SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Umpqua Chub (*Oregonichthys kalawatseti*)  
Umpqua Mariposa Lily (*Calochortus umpquaensis*)  
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

Wayside Aster (*Eucephalus vialis*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Pond Turtle (*Actinemys marmorata*)  
Western Ridged Mussel (*Gonidea angulata*)  
Western Toad (*Anaxyrus boreas*)  
White-headed Woodpecker (*Picoides albolarvatus*)  
Yellow-breasted Chat (*Icteria virens auricollis*)

## CONSERVATION OPPORTUNITY AREAS

Anderson Butte [COA ID: 103]  
Antelope Creek-Paynes Cliffs [COA ID: 099]  
Big Butte Area [COA ID: 122]  
Cape Ferrello [COA ID: 051]  
Chetco River-Winhchuck River Estuaries [COA ID: 052]  
East Fork Illinois River [COA ID: 101]  
Grave Creek [COA ID: 094]  
Illinois River-Silver Creek [COA ID: 096]  
Kalmiopsis Area [COA ID: 100]  
King Mountain Area [COA ID: 095]  
Lower Rogue River and Estuary [COA ID: 049]  
North Medford Area [COA ID: 097]  
North Umpqua River Area [COA ID: 090]  
Oregon Caves-Applegate Area [COA ID: 102]  
Pistol River Estuary [COA ID: 050]  
Rogue River [COA ID: 093]  
Shady Cove Foothills [COA ID: 098]  
Siskiyou Crest Area [COA ID: 104]  
Soda Mountain Area [COA ID: 124]  
South Fork Coquille [COA ID: 046]  
South Fork Umpqua River and Tributaries [COA ID: 091]  
Tenmile Area [COA ID: 092]  
Umpqua Headwaters [COA ID: 119]  
Umpqua River [COA ID: 042]  
Upper Siuslaw [COA ID: 089]

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## STRATEGY SPOTLIGHT: ROGUE RIVER SALMON AND STEELHEAD

The Rogue River is unique, with an ecosystem much more similar to California watersheds than any coastal watersheds in Oregon. Rogue salmon and steelhead are included in management units with California salmon and steelhead, rather than with Oregon coastal populations.

### Spring Chinook

The Rogue River's spring Chinook salmon, particularly the early-returning, early-spawning portion of the population, declined drastically following construction and operation of William Jess Dam and Lost Creek Reservoir. With post-dam spawning habitat limited to approximately 30 miles of the river between the Gold Ray area and Cole Rivers Fish Hatchery as well as Big Butte Creek, the population remains below the desired status level outlined in the [2007 Rogue River Spring Chinook Conservation Plan](#). The plan outlines management actions to restore numbers of naturally-produced spring Chinook, with a focus on safe reservoir operation by the U.S. Army Corps of Engineers to benefit spring Chinook.

While the population is below desired status levels (10-year average return of over 15,000), returns in recent years are well above levels that trigger conservation concerns. The estimate of abundance in 2014 was 5,593 naturally produced spring Chinook on the Rogue, but the 2015 estimate is expected to be 15,320 fish.

### Steelhead

Summer steelhead is the iconic fish species of the Rogue going back to the days of author Zane Grey. Summer steelhead on the Rogue are different than any other summer steelhead in Oregon. The primary difference is their "half pounder" life history. After only a few months at sea, Rogue summer steelhead swim back to the river in late summer as 12 to 14 inch fish to rear and feed. Later, the fish head back to sea before returning on a spawning run. Because time spent in the ocean is reduced, Rogue summer steelhead do not grow as large as steelhead in rivers to the north (most are less than 24 inches in length), but the half pounder run provides a popular fishery in the lower river.

Rogue summer steelhead rear for up to three (or occasionally four) years in freshwater before migrating to sea, relying on good stewardship of Rogue streams to reach the age and size of a smolt to survive the ocean migration. During their time in freshwater, many juveniles migrate back and forth seasonally between small streams and the Rogue River. Barriers such as poorly-placed culverts can easily block migration by juvenile fish and greatly affect smolt production in the river. The fish have evolved to spawn successfully in small and intermittent streams, but these streams are often ignored and not considered to be fish streams by the general public.

The Oregon Department of Fish and Wildlife (ODFW) believes that summer steelhead are a priority for restoration on the Rogue. Returns meet population health goals on many years but not on an annual



basis. Reliance on sensitive habitat is the primary reason for priority status. Restoration will not only ensure a healthy, sustainable population of summer steelhead in the Rogue but will benefit other fish species as well.

### **Coho salmon**

Coho salmon are listed as threatened on the federal Endangered Species List as part of the Southern Oregon Northern California Coast (SONCC) ESU, and are the only federally-listed fish species on the Rogue. The ODFW organized an [expert panel](#) to identify the factors limiting coho production in the Rogue watershed. Unlike coho found in the rest of western Oregon, the expert panel considered summer temperatures and low streamflow to be among the primary limiting factors for Rogue coho. Restoration of summer streamflow and riparian vegetation to keep streams cool will help produce more coho on the Rogue.

ODFW supports restoration actions that address the limiting factors identified in the expert panel summary for coho in the Oregon portion of SONCC. Restoration projects that benefit both coho and summer steelhead – fish that rear in freshwater streams for at least one year – will provide the biggest ecological benefit for Rogue fish populations.



*Photo Credit: Rodney Klus, ODFW*

## NORTHERN BASIN AND RANGE

### DESCRIPTION

The Northern Basin and Range ecoregion is sagebrush country. It is Oregon's slice of the Old West, with rich ranching and farming traditions.

The Northern Basin and Range ecoregion covers the southeastern portion of the state, from Burns south to the Nevada border and from the Christmas Valley east to Idaho. The name describes the landscape, numerous flat basins separated by isolated mountain ranges. Several important mountains are fault blocks, with gradual slopes on one side and steep basalt [rims and cliffs](#) on the other side. The Owyhee Uplands consist of a broad plateau cut by deep river canyons. Elevations range from 2,070 feet near the Snake River to more than 9,700 feet on the Steens Mountain.

In the rain shadow of the Cascades Mountains, the Northern Basin and Range is Oregon's driest ecoregion marked by extreme ranges of daily and seasonal temperatures. Much of the ecoregion receives less than 15 inches of precipitation per year, although mountain peaks receive 30-40 inches per year. The extreme southeastern corner of the state has desert-like conditions, with annual precipitation of only 8-12 inches. Runoff from precipitation and mountain snowpack often flows into low, flat playas where it forms seasonal shallow lakes and marshes. Most of these basins contained large, deep lakes during the late Pleistocene, between 40,000 and 10,000 years ago. As these lakes, which don't drain to the ocean, dried through evaporation, they left salt and mineral deposits that formed [alkali flats](#), extremely important stopover sites for migratory shorebirds due to the rich source of invertebrate prey.

[Sagebrush communities](#) dominate the landscape. Due to the limited availability of water, sagebrush is usually widely spaced and associated with an understory of forbs and perennial bunchgrasses, such as bluebunch wheatgrass and Idaho fescue. The isolated mountain ranges have few forests or woodlands, with rare white fir stands in Steens Mountain and Hart Mountain. However, aspen and [mountain mahogany](#) are more widespread and can be found in the Trout Creeks, Steens Mountain, Pueblo Mountains, Oregon Canyon Mountain, and Mahogany Mountains. In the southern portion of the

ecoregion, there are vast areas of desert shrubland, called salt-desert scrub, dominated by spiny, salt-tolerant shrubs. Throughout the ecoregion, soils are typically rocky and thin, low in organic matter, and high in minerals.

The Northern Basin and Range ecoregion is sparsely inhabited, but the local communities have vibrant cultural traditions. The largest community is Ontario, with more than 11,000 people. Other communities include Nyssa, Vale, Burns, and Lakeview, with 2,400 to 3,100 people each. Land ownership is mostly federal and primarily administered by the BLM. Livestock and agriculture are the foundations of the regional economy. Food processing is important in Malheur County. Recreation is a seasonal component of local economies, particularly in Harney County. Hunting contributes to local economies, as does wildlife viewing, white-water rafting, and camping. Historically, lumber processing and harvesting from the nearby Blue Mountains was the basis of some local communities, particularly for Burns. However, these industries have declined with lower harvests from neighboring federal forests.

## CHARACTERISTICS



### Important Industries

Livestock, forest products, agriculture, food processing, recreation

## Major Crops

Alfalfa, wheat, hay, corn, oats, onions, sugar beets, potatoes

## Elevation

2,070 feet (Snake River) to 9,733 feet (Steens Mountain)

## Important Rivers

Donner und Blitzen, Malheur, Owyhee, Silvies

## CONSERVATION ISSUES AND PRIORITIES

Uncontrolled livestock grazing in the decades before enactment of the Taylor Grazing Act of 1934 caused serious long-term ecological damage throughout the ecoregion. Rangeland conditions have substantially improved since then in most areas, and grazing is managed sustainably in many parts of the ecoregion. However, some areas are still impacted. In addition, sensitive areas, such as riparian habitats and arid areas of [sagebrush](#) and [salt desert](#), have been slow to recover.

Some areas are still recovering from intensive management in the past. For example, the BLM began a massive effort in 1962 to rehabilitate degraded rangelands by removing the native sagebrush and establishing crested wheatgrass, a non-native pasture grass. Over the course of 10 years, the Vale Rehabilitation Project seeded 250,000 acres to crested wheatgrass and used plowing, chaining, and herbicides to reduce sagebrush on as much as 506,000 acres. Currently, the BLM maintains extensive wilderness areas in this ecoregion, including the Malheur Refuge, Hart Mountain, Steens Cooperative Management and Protection Area, and BLM Areas of Critical Environmental Concern at Lake Abert, Warner Valley, and Owyhee canyons.

Historical overgrazing and fire suppression, followed by invasion of non-native annual grasses such as cheatgrass, have greatly altered natural fire cycles in many sagebrush steppe habitats. Landscapes formerly comprised of mosaics dominated by bunchgrasses and forbs are now heavily and disproportionately dominated by shrubs (mostly sagebrush) and exotic grasses and forbs. Invasive species and altered fire regimes are the greatest terrestrial conservation issues in this ecoregion. As a result of altered fire regimes, encroachment of juniper has displaced grasses and sagebrush, especially in the northern portions of the ecoregion. However, old-growth juniper occurs in some areas, especially in rock outcrops where grasses and sagebrush are uncommon and where fire is less of a factor. These [old-growth juniper](#) are extremely beneficial to wildlife.

Greater Sage-Grouse are considered excellent indicators of sagebrush habitat quality. Current efforts to improve conditions for the Greater Sage-Grouse include comprehensive range-wide assessments and conservation planning.

Stream water quality in the Northern Basin and Range ecoregion is poor when compared to other ecoregions. Throughout the Northern Basin and Range ecoregion, water quality is impacted by high temperatures, and in some areas, by bacteria, pollutants, and aquatic weeds. Water is limited in the ecoregion, fully allocated in storage and other uses. Aquatic habitats are affected by altered channel and flow conditions, obstructions, and poor riparian condition. Efforts to assess the quality of aquatic habitats are ongoing, and priorities include assessment of the impact of federal dams on water quantity, and obtaining an understanding of natural temperature and water quality dynamics in the ecoregion. Under [climate change](#), drought conditions may become more frequent, resulting in reduced water availability for wetlands in important wildlife areas like Summer Lake, Lake Abert, and Malheur Lake.

[Key Conservation Issues](#) in the Northern Basin and Range ecoregion include [Invasive Species](#), [Water Quality and Quantity](#), and [Disruption of Disturbance Regimes](#). In addition to the statewide issues, increasing demand for energy development, ongoing recovery from historical overgrazing, unregulated horse herds, uncontrolled OHV use, and increasing recreational demand are issues in this ecoregion.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

Energy Development

[Climate change](#) and global economies are increasing pressure for [renewable energy development](#), including wind and geothermal energy. Energy projects offer environmental benefits but also have impacts on fish, wildlife, and their habitats. The Northern Basin and Range ecoregion offers excellent renewable energy resources that are useful to address climate change in the ‘big picture’, but the ecoregion is sensitive to local [impacts on sagebrush](#) and other habitats.

### Recommended Approach

Plan energy projects carefully, using best available information and consultation with biologists. Use available tools and resources found in the [Land Use Changes](#) and [Climate Change](#) KCIs and ODFW [Compass](#).

### Limiting Factor:

Invasive Species

Invasive plants, including noxious weeds and cheatgrass, are of particular concern in the Northern Basin and Range ecoregion. They disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands. Invasive plants have been increasing during the last 80 years. The spread of cheatgrass and medusahead can increase the frequency, intensity, and spread of fires, replacing sagebrush and native bunchgrasses, which are adapted to infrequent, patchy fires. While not nearly as extensive as invasive plants, non-native animals have also impacted native fish and wildlife populations. For example, invasive carp in [Malheur Lake](#) have damaged one of the most

important waterfowl production areas in Oregon, altering ecological dynamics through predation and altering water quality by disturbing sediments (see this [video clip](#) for more information).

### **Recommended Approach**

Emphasize prevention, risk assessment, early detection, and quick control to prevent new [invasive species](#) from becoming fully established. Use multiple site-appropriate tools (e.g., mechanical, chemical, and biological) to control the most damaging invasive species. Prioritize efforts to focus on key invasive species in high priority areas, particularly where [Strategy Habitats](#) and [Strategy Species](#) occur. Cooperate with partners through habitat programs and county weed boards to address invasive species problems. Use of fire helps treat juniper or medusa head. Carefully manage wildfires in cheatgrass-dominated areas. Promote the use of native “local” stock for restoration and revegetation where native species have the greatest potential to successfully establish. In some cases, use “assisted succession” strategies, applying low seed rates of non-invasive non-native plants in conjunction with native plant seeds as an intermediate step in rehabilitating disturbances in sagebrush communities.

### **Limiting Factor:**

#### The Spread of Western Juniper and Altered Fire Regimes

Although an important native woodland tree in the East Cascades ecoregion, western juniper has been rapidly expanding its range over the last 40 years. The reasons for this expansion are not clear, although changes in fire regimes, overgrazing, and climate changes may have a role. This rapid expansion of western juniper has degraded some grassland, sagebrush, riparian, large-diameter juniper, and aspen habitats. Western juniper expansion may reduce water availability in many seasonal and some perennial streams. In many of the grassland and sagebrush habitats, 20-30 year old juniper trees form dense stands that are not suitable for many wildlife species that require open sagebrush or grassland habitats that are now in decline. In riparian areas, junipers replace deciduous shrubs and trees that are more beneficial to riparian wildlife. Western juniper is a native species, and [old growth juniper trees](#) in rocky outcrops offer benefits to native wildlife.

Most big [sagebrush-dominated](#) areas were once a mosaic of successional stages, from recently burned areas dominated by grasses and forbs to old sagebrush-dominated stands that have not burned for 80 to 300 years. However, changes in fire patterns have reduced this mosaic and resulted in large areas dominated by invasive annual grasses, or older big sagebrush with an understory of invasive annual plants.

Increasingly dry conditions are contributing to increased frequency of fires, resulting in landscapes that are susceptible to the spread of western juniper and cheatgrass. Previously, fire suppression resulted in undesirable changes in vegetation, contributing to the build-up of woody plants that increase the intensity of fires. Areas dominated by cheatgrass or other invasive annual grasses are more conducive to fire ignition and reburning.

While a useful tool, prescribed fire might not be suitable for some sagebrush habitats because some sagebrush communities are very slow to recover from a fire. Big sagebrush communities with non-native invasive annuals in the understory will not recover from fire without significant intervention.

### **Recommended Approach**

Controlling western juniper in newly invaded areas benefits wildlife and other habitat values. Early control of newly invaded young trees before woodlands become established is often the most successful approach.

In some areas, fire can be used to control young juniper. Carefully evaluate sites to determine if **prescribed fire** is appropriate, considering the landscape context and vegetation types. Under current vegetation management conditions, fire is damaging to sagebrush stands. If determined to be ecologically beneficial, reintroduce natural fire regimes using site-appropriate prescriptions that account for the historical fire regime, as well as area size and vegetation characteristics that affect resiliency and resistance to disturbance. Use prescribed fire to create a mosaic of successional stages, and avoid large prescribed fires.

In areas where prescribed fire is not practical, use mechanical treatment methods (e.g., chipping, cutting for firewood) that minimize soil disturbance. Chemical, mechanical, or biological management techniques can be combined along with prescribed fire.

Develop markets for small juniper trees as a special forest product to reduce restoration costs. Maintain large-diameter juniper trees in the native rocky outcrops and ridges, which are important nesting habitat for passerines and raptors.

### **Limiting Factor:**

#### Ongoing Recovery From Historical Overgrazing

Prior to limitations that were initiated on public lands in the mid-1930s, livestock grazing had a profound influence on landscapes throughout the Northern Basin and Range ecoregion. Many areas experienced serious ecological damage. Conditions on rangelands in general have improved substantially over the past half-century as a result of improvements in livestock management, and most ecosystems are recovering. However, some habitats have been slow to recover, such as some **riparian** areas and **sagebrush** communities, especially where cheatgrass has invaded.

### **Recommended Approach**

Continue to proactively manage livestock grazing and restore degraded habitats. Minimize grazing during restoration of highly sensitive areas, such as wetlands and riparian areas.

### **Limiting Factor:**

Uncontrolled Off-highway Vehicle Use

Use by OHVs continues to increase. While limited and controlled, OHV use can be compatible with wildlife conservation. Unlimited and uncontrolled use can:

- impact riparian, aquatic, and upland habitats
- spread invasive plant seeds
- affect wildlife behavior and distribution, especially during critical breeding and wintering periods
- damage soils
- increase risk of wildfires

Although OHV use is limited to designated roads in some sensitive landscapes, there is little to no enforcement due to lack of funds and law enforcement personnel.

### **Recommended Approach**

Work cooperatively with land managers and OHV groups to direct use to maintained trails in low-impact areas and improve enforcement of existing rules. Support educational efforts to promote low-impact recreational use such as the [Tread Lightly! Program](#). Monitor OHV impacts at priority areas. Support efforts to effectively manage OHV use on public lands, particularly in highly sensitive habitats, and restore damaged areas.

### **Limiting Factor:**

#### Unmanaged Recreational Use

In addition to OHV use, other recreational use, such as camping, rock climbing, and parasailing, is increasing. Although recreational use is still light in comparison to other ecoregions, new uses could compound impacts to wildlife by increasing disturbance and making previously remote areas more accessible to people.

### **Recommended Approach**

Proactively consider potential impacts to wildlife and habitats when developing or promoting recreational opportunities to encourage compatible uses. Monitor recreational patterns and trends.

### **Limiting Factor:**

#### Unregulated Horse Herds Disturb Wildlife and Compete for Water and Other Resources

Oregon's herds of [wild horses](#) are a well-recognized feature on rangeland, but the herds require intensive management attention, including resource-intensive adoption and translocation programs allowed under the Wild Horse & Burro Act (BLM 1971). Unregulated horse herds negatively impact native vegetation, compete with wildlife for water and food, and disrupt habitat use by wildlife. The effects of climate change are likely to exacerbate these impacts.



## Recommended Approach

Promote dialogue between wildlife managers, land owners, and land managers to develop management plans based on common priorities. Managing horse and burro populations is critical, both for their well-being and for ecosystem health. Promote outreach to explain the issue to the public. Use opinion polling results to inform management decisions and help agencies balance multiple priorities.

## Limiting Factor:

### Water Distribution in Arid Areas and Wildlife Entrapment in Water Developments

In arid areas, water availability can limit animal distribution. Water developments established for domestic livestock and wildlife can significantly benefit birds, bats, and small mammals. However, some types of these facilities, particularly water developments for large ungulates, can have unintentional hazards. These hazards include over-hanging wires that act as trip lines for [bats](#), steep side walls that act as entrapments under low water conditions, or unstable perches that cause animals to fall into the water. If an escape ramp is not provided, small animals cannot escape and will drown.

## Recommended Approach

Continue current efforts to provide water for wildlife in arid areas. Continue current design of big game “guzzlers” that accommodate a variety of species, and retrofit older models where appropriate to make them compatible with newer design standards. Use and maintain [escape devices](#) on water developments where animals can become trapped. Remove obstacles that could be hazardous to wildlife from existing developments.

## STRATEGY SPECIES

Alvord Chub (*Siphateles alvordensis*)  
American Pika (*Ochotona princeps*)  
American White Pelican (*Pelecanus erythrorhynchos*)  
Black-necked Stilt (*Himantopus mexicanus*)  
Bobolink (*Dolichonyx oryzivorus*)  
Boggs Lake Hedge Hyssop (*Gratiola heterosepala*)  
Borax Lake Chub (*Siphateles boraxobius*)  
Borax Lake Ramshorn (*Planorbella oregonensis*)  
Bull Trout, Malheur River SMU (*Salvelinus confluentus*)  
Burrowing Owl (*Athene cunicularia hypugaea*)  
California Myotis (*Myotis californicus*)  
Caspian Tern (*Hydroprogne caspia*)  
Columbia Clubtail (*Gomphus lynnae*)  
Columbia Spotted Frog (*Rana luteiventris*)  
Cronquist’s Stickseed (*Hackelia cronquistii*)

Crosby's Buckwheat (*Eriogonum crosbyae*)  
Davis' Peppergrass (*Lepidium davisii*)  
Ferruginous Hawk (*Buteo regalis*)  
Foskett Spring Speckled Dace (*Rhinichthys osculus robustus*)  
Franklin's Gull (*Leucophaeus pipixcan*)  
Fringed Myotis (*Myotis thysanodes*)  
Golden Buckwheat (*Eriogonum chrysops*)  
Gray Wolf (*Canis lupus*)  
Great Basin Redband Trout, Catlow Valley SMU (*Oncorhynchus mykiss newberrii*)  
Great Basin Redband Trout, Chewaucan SMU (*Oncorhynchus mykiss newberrii*)  
Great Basin Redband Trout, Fort Rock SMU (*Oncorhynchus mykiss newberrii*)  
Great Basin Redband Trout, Malheur Lakes SMU (*Oncorhynchus mykiss newberrii*)  
Great Basin Redband Trout, Warner Lakes SMU (*Oncorhynchus mykiss newberrii/stonei*)  
Greater Sage-Grouse (*Centrocercus urophasianus*)  
Greater Sandhill Crane (*Antigone canadensis tabida*)  
Grimy Ivesia (*Ivesia rhypara* var. *rhypara*)  
Hoary Bat (*Lasiurus cinereus*)  
Hutton Spring Tui Chub (*Siphateles bicolor oregonensis*)  
Juniper Titmouse (*Baeolophus ridgwayi*)  
Kit Fox (*Vulpes macrotis*)  
Lahontan Cutthroat Trout, Coyote Lake SMU (*Oncorhynchus clarki henshawi*)  
Lahontan Cutthroat Trout, Quinn River SMU (*Oncorhynchus clarki henshawi*)  
Long-billed Curlew (*Numenius americanus*)  
Long-legged Myotis (*Myotis volans*)  
Malheur Cave Amphipod (*Stygobromus hubbsi*)  
Malheur Cave Flatworm (*Kenkia rhynchida*)  
Malheur Cave Springtail (*Oncopodura mala*)  
Malheur Isopod (*Amerigoniscus malheurensis*)  
Malheur Pseudoscorpion (*Apochthonius malheuri*)  
Malheur Valley Fiddleneck (*Amsinckia carinata*)  
Malheur Wire-lettuce (*Stephanomeria malheurensis*)  
Monarch Butterfly (*Danaus plexippus*)  
Mountain Quail (*Oreortyx pictus*)  
Mulford's Milkvetch (*Astragalus mulfordiae*)  
Owyhee Clover (*Trifolium owyheense*)  
Packard's Mentzelia (*Mentzelia packardiae*)  
Pallid Bat (*Antrozous pallidus*)  
Peregrine Falcon (*Falco peregrinus anatum*)  
Pit Sculpin (*Cottus pitensis*)  
Pygmy Rabbit (*Brachylagus idahoensis*)

Silver-haired Bat (*Lasionycteris noctivagans*)  
Smooth Mentzelia (*Mentzelia mollis*)  
Snake River Goldenweed (*Pyrrocoma radiata*)  
Snowy Egret (*Egretta thula*)  
Spotted Bat (*Euderma maculatum*)  
Spring Chinook Salmon, Upper Snake SMU (*Oncorhynchus tshawytscha*)  
Sterile Milkvetch (*Astragalus cusickii* var. *sterilis*)  
Swainson's Hawk (*Buteo swainsoni*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Trumpeter Swan (*Cygnus buccinator*)  
Warner Sucker (*Catostomus warnerensis*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Snowy Plover (*Charadrius nivosus nivosus*)  
Western Toad (*Anaxyrus boreas*)  
White-tailed Jackrabbit (*Lepus townsendii*)  
Willow Flycatcher (*Empidonax traillii*)

## CONSERVATION OPPORTUNITY AREAS

Alkali Lake [COA ID: 190]  
Alvord Lake Basin [COA ID: 194]  
Basque Hills Area Plains [COA ID: 202]  
Brothers-North Wagontire [COA ID: 184]  
Bully Creek Area [COA ID: 183]  
Chewaucan River [COA ID: 141]  
Crowley [COA ID: 185]  
Foster Flat-Black Rim Sagebrush Area [COA ID: 191]  
Harney-Malheur Area [COA ID: 187]  
Hart Mountain Area [COA ID: 200]  
Jordan Creek Wetlands [COA ID: 195]  
Lake Abert [COA ID: 197]  
Little Louse Canyon [COA ID: 205]  
Long Creek-Coyote Creek-Silver Creek [COA ID: 135]  
Malheur River Headwaters [COA ID: 180]  
Middle Owyhee River Area [COA ID: 186]  
Pueblo Mountain [COA ID: 203]  
Quartz Mountain [COA ID: 131]  
Rattlesnake Creek-Calamity Creek Area [COA ID: 181]  
Sage Hen Creek [COA ID: 201]  
Silver Creek Area [COA ID: 175]

Soldier Creek-Upper Owyhee River [COA ID: 196]  
South Fork Crooked River Area [COA ID: 174]  
Steens Mountain [COA ID: 192]  
Summer Lake Area [COA ID: 189]  
Ten Cent Lake-Juniper Lake Area [COA ID: 193]  
Three Forks [COA ID: 206]  
Trout Creek Mountains [COA ID: 204]  
Upper Silvies River [COA ID: 178]  
Upper South Fork Malheur Area [COA ID: 188]  
Warner Basin Wetlands [COA ID: 199]  
Warner Mountains [COA ID: 146]  
Warner West [COA ID: 198]  
Willow Creek-Birch Creek Area [COA ID: 167]



*Photo Credit: USFS*

## WEST CASCADES

### DESCRIPTION

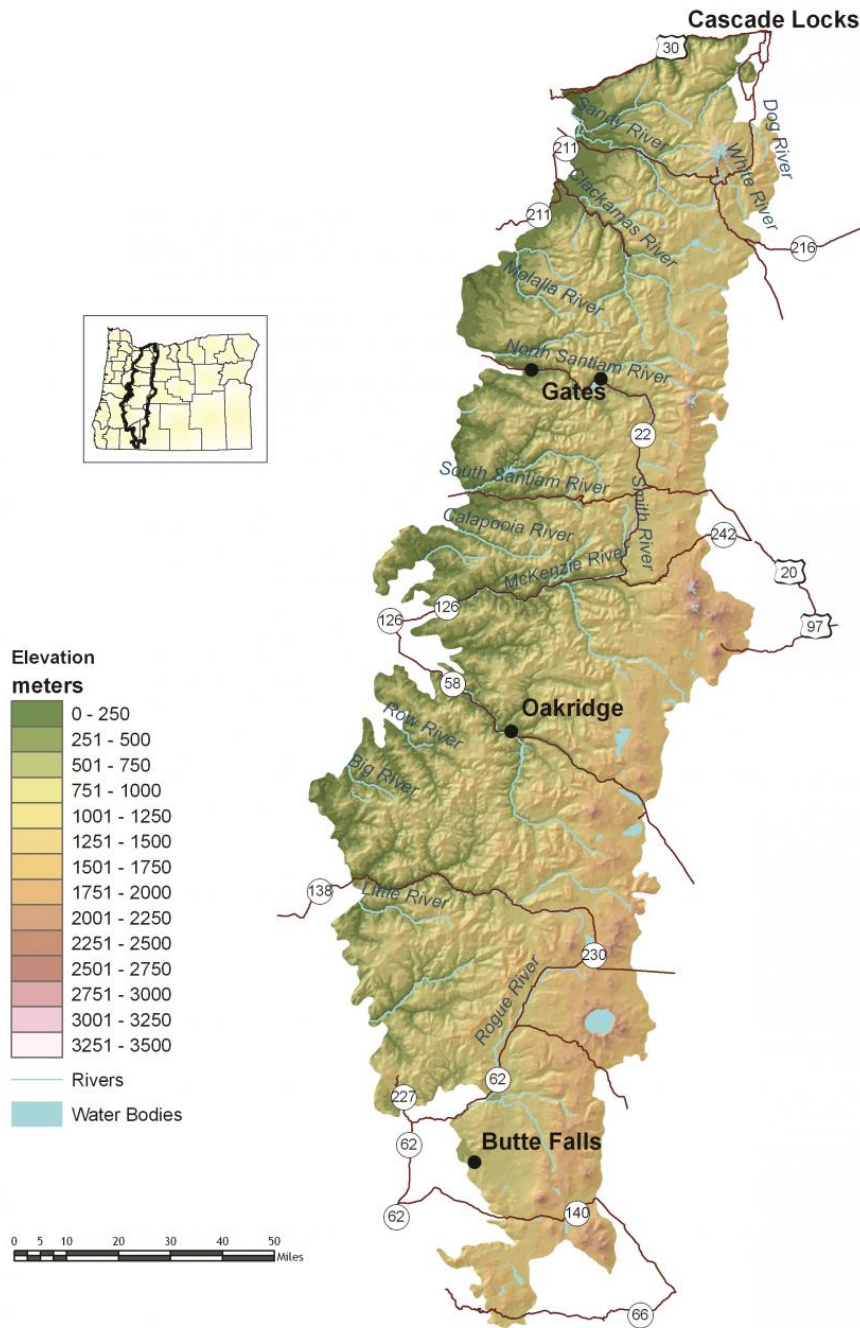
The West Cascades ecoregion extends from just east of the Cascade Mountains' summit to the foothills of the Willamette, Umpqua, and Rogue Valleys, and spans the entire length of the state of Oregon, from the [Columbia River](#) to the California border. The topography and soils of the West Cascades ecoregion have been shaped dramatically by its volcanic past. Geologically, the West Cascades ecoregion has two distinct areas: the younger volcanic crest (approximately 3 million years old) and the "old Cascades" to the west of the crest (at least 30 million years old). The volcanic crest includes the highest peaks in Oregon: Mt. Hood, Mt. Jefferson, and North, Middle, and South Sisters, all more than 10,000 feet. The "old Cascades" are characterized by long, steep ridges and wide, glaciated valleys.

This ecoregion is almost entirely forested by conifers, although the dominant tree species vary by elevation, site characteristics, and stand history. Douglas-fir is the most common tree below 4,000 feet, often with western hemlock as a co-dominant. At higher elevations, dominant tree species include Pacific silver fir, mountain hemlock, or subalpine fir. Other common conifers include western red cedar, grand fir, and noble fir. Above approximately 7,000 feet, the conditions are too severe for tree growth, and [alpine parklands](#) and dwarf shrubs predominate, including some wetlands and barren expanses of rock and ice. The climate and resulting fire regime vary with latitude and elevation. Fire regimes in the forests vary across the ecoregion, with the northern portion of the ecoregion seeing less frequent but more severe fires, whereas the southern portion is typically drier with frequent, lightning-caused fires. In the southern areas, [ponderosa pine](#), sugar pine, and incense cedar often are found with Douglas-fir at the lower elevations. At the lower elevations, winter conditions are mild with high rainfall. Above 4,000 feet, much of the precipitation occurs as snowfall.

The West Cascades ecoregion houses just over 1 percent of Oregon's population, mostly in towns including Cascade Locks, Butte Falls, Detroit, Gates, Idanha, McKenzie Bridge, Blue River, Oakridge, Westfir, and part of Sweet Home (the remainder of which lies in the Willamette Valley ecoregion). Local economies were once entirely dependent on timber harvest but have been greatly affected as market

conditions (long-term and broad-scale changes in the forest products marketplace) and shifts in public forest management priorities have shaped Oregon’s timber industry. Many towns are increasingly promoting recreational opportunities, including hiking, camping, fishing, hunting, birding, mountain biking, and skiing. However, timber harvest is expected to remain important to local West Cascades economies in the future.

## CHARACTERISTICS



### **Important Industries**

Timber, recreation

### **Major Crops**

Fruits, mint

### **Important Nature-based Recreational Areas**

Mt. Hood, Willamette, Umpqua, and Rogue River National Forests; Waldo Lake; Odell Lake; Detroit and Hills Creek Reservoirs; includes about half of Crater Lake National Park

### **Elevation**

98 feet (along the western border of the ecoregion) to 11,040 feet (Cascade peaks)

### **Important Rivers**

Clackamas (Oak Grove Fork), McKenzie, Rogue, Umpqua, Breitenbush, Middle Santiam, North and Middle Fork of the Willamette

## **CONSERVATION ISSUES AND PRIORITIES**

Of all of Oregon's ecoregions, the West Cascades is considered the healthiest by several indicators. For example, this ecoregion has the highest water quality in the state, and the fewest problems with water allocation and quantity. Very few species have been extirpated from this ecoregion, and there has been considerable effort toward recovering threatened and endangered species. Much of the remnant classic late-successional forests on public land are managed with an emphasis on biodiversity under the Northwest Forest Plan. Although focused on the Northern Spotted Owl, the plan was intended to address the needs of a wide array of species affected by loss and fragmentation of late-successional forests, and covers more than 1,000 species of plants, animals, and fungi. However, the adaptive management component of the Northwest Forest Plan has not been fully implemented. Also, many forests in the West Cascades ecoregion are in [Fire Regime Condition Class II](#), with moderate risk of losing one or more ecosystem components.

[Key Conservation Issues](#) of particular concern in the West Cascades ecoregion include [Disruption of Disturbance Regimes](#), [Invasive Species](#), and [Barriers to Animal Movement](#). Additionally, recreational impacts are an emerging conservation issue here.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

Uncharacteristically Severe Wildfire

Many forests in the West Cascades ecoregion are in [Fire Regime Condition Class II](#), with moderate risk of losing one or more ecosystem components. Efforts to reduce risks of uncharacteristically severe fires can help to restore habitat but require careful planning to provide sufficient habitat features that are important to wildlife (e.g., snags, downed logs, hiding cover).

### Recommended Approach

Use an integrated approach to [wildfire issues](#) that considers historical conditions, wildlife conservation, natural fire intervals, and silvicultural techniques. Encourage forest management at a broad scale to address limiting factors. Reintroduce fire where feasible; prioritize sites and applications. Maintain important wildlife habitat features, such as snags and logs, to sustain dead wood-dependent species. Monitor these efforts, and use adaptive management techniques to ensure efforts are meeting habitat restoration and wildfire prevention objectives with minimal impacts on wildlife.

### Limiting Factor:

Invasive Species

Non-native plant and animal invasions disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands.

### Recommended Approach

Emphasize prevention, risk assessment, early detection, and quick control to prevent new [invasive species](#) from becoming fully established. Prioritize efforts to focus on key invasive species in high priority areas, particularly where [Strategy Habitats](#) and [Strategy Species](#) occur. Where needed, use multiple site-appropriate tools (e.g., mechanical, chemical, and biological) to control the most damaging invasive species. Promote the use of native species for restoration and revegetation.

### Limiting Factor:

Passage Barriers

[Passage barriers](#), such as dams and culverts, reduce available habitat for fish and aquatic species in the West Cascades.

### Recommended Approach

Continue working with [Oregon Watershed Enhancement Board](#), Oregon Department of Transportation, Oregon Department of Forestry, USFS, BLM, counties, local municipalities, irrigation districts, and other



partners to inventory, prioritize, and provide fish passage at artificial obstructions, leveraging current work done by [ODFW's Fish Passage Task Force](#) to expand implementation of fish passage priorities.

**Limiting Factor:**

Increasing Recreational Activity

Increasing demands for year-round recreational activity, including new mountain bike trails, ski lifts, and skill parks, can disturb wildlife. Ski seasons are becoming shorter, contributing to the demand for year-round recreational activity.

**Recommended Approach**

Plan new recreational trail systems carefully and with consideration for native wildlife and their habitats. For example, limit night riding to certain areas to minimize disturbance to wildlife, avoiding areas more sensitive to damage such as wetlands. Take advantage of abandoned or closed roads, rail lines, or previously impacted areas for conversion into trails. Work with the land management agencies such as the USFS to designate areas as high value recreation and low habitat impact areas.

**STRATEGY SPECIES**

- American Marten (*Martes americana*)
- American Pika (*Ochotona princeps*)
- Beller's Ground Beetle (*Agonum belleri*)
- Black Petaltail (*Tanypteryx hageni*)
- Black Swift (*Cypseloides niger borealis*)
- Bull Trout, Deschutes SMU (*Salvelinus confluentus*)
- Bull Trout, Hood SMU (*Salvelinus confluentus*)
- Bull Trout, Klamath Lake SMU (*Salvelinus confluentus*)
- Bull Trout, Odell Lake SMU (*Salvelinus confluentus*)
- Bull Trout, Willamette SMU (*Salvelinus confluentus*)
- California Mountain Kingsnake (*Lampropeltis zonata*)
- California Myotis (*Myotis californicus*)
- Cascade Torrent Salamander (*Rhyacotriton cascadae*)
- Cascades Frog (*Rana cascadae*)
- Clouded Salamander (*Aneides ferreus*)
- Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*)
- Coastal Tailed Frog (*Ascaphus truei*)
- Coho Salmon, Lower Columbia SMU (*Oncorhynchus kisutch*)
- Coho Salmon, Rogue SMU (*Oncorhynchus kisutch*)
- Columbia Gorge Caddisfly (*Neothremma andersoni*)
- Columbia Gorge Hesperian (*Vespericola depressa*)

Cope's Giant Salamander (*Dicamptodon copei*)  
Fall Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)  
Fisher (*Pekania pennanti*)  
Flammulated Owl (*Psiloscoops flammeolus*)  
Foothill Yellow-legged Frog (*Rana boylei*)  
Franklin's Bumble Bee (*Bombus franklini*)  
Fringed Myotis (*Myotis thysanodes*)  
Gray Wolf (*Canis lupus*)  
Great Basin Redband Trout, Upper Klamath Basin SMU (*Oncorhynchus mykiss newberrii*)  
Great Gray Owl (*Strix nebulosa*)  
Great Spangled Fritillary (*Speyeria cybele*)  
Greater Sandhill Crane (*Antigone canadensis tabida*)  
Harlequin Duck (*Histrionicus histrionicus*)  
Hoary Bat (*Lasiurus cinereus*)  
Larch Mountain Salamander (*Plethodon larselli*)  
Leona's Little Blue Butterfly (*Philotiella leona*)  
Lewis's Woodpecker (*Melanerpes lewis*)  
Long-legged Myotis (*Myotis volans*)  
Monarch Butterfly (*Danaus plexippus*)  
Northern Goshawk (*Accipiter gentilis atricapillus*)  
Northern Red-legged Frog (*Rana aurora*)  
Northern Spotted Owl (*Strix occidentalis caurina*)  
Northern Wormwood (*Artemisia campestris* var. *wormskioldii*)  
Olive-sided Flycatcher (*Contopus cooperi*)  
Oregon Chub (*Oregonichthys crameri*)  
Oregon Shoulderband (*Helminthoglypta hertleini*)  
Oregon Slender Salamander (*Batrachoseps wrighti*)  
Oregon Spotted Frog (*Rana pretiosa*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Purple Martin (*Progne subis arboricola*)  
Red Tree Vole (*Arborimus longicaudus*)  
Ringtail (*Bassariscus astutus*)  
Sierra Nevada Red Fox (*Vulpes vulpes necator*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Spring Chinook Salmon, Coastal SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Rogue SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Willamette SMU (*Oncorhynchus tshawytscha*)  
Summer Steelhead / Coastal Rainbow Trout, Coastal SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)

Summer Steelhead / Coastal Rainbow Trout, Lower Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Summer Steelhead / Coastal Rainbow Trout, Rogue SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Umpqua Chub (*Oregonichthys kalawatseti*)  
Umpqua Mariposa Lily (*Calochortus umpquaensis*)  
Wayside Aster (*Eucephalus vialis*)  
Western Brook Lamprey (*Lampetra richardsoni*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Painted Turtle (*Chrysemys picta bellii*)  
Western Pond Turtle (*Actinemys marmorata*)  
Western Toad (*Anaxyrus boreas*)  
White Rock Larkspur (*Delphinium leucophaeum*)  
Winter Steelhead / Coastal Rainbow Trout, Lower Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Winter Steelhead / Coastal Rainbow Trout, Willamette SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)

## CONSERVATION OPPORTUNITY AREAS

Antelope Creek-Paynes Cliffs [COA ID: 099]  
Big Butte Area [COA ID: 122]  
Big Marsh Creek [COA ID: 133]  
Breitenbush River [COA ID: 110]  
Bull of the Woods, North [COA ID: 108]  
Bull Run-Sandy Rivers [COA ID: 105]  
Calapooia River [COA ID: 082]  
Central Cascades Crest, Southeast [COA ID: 116]  
Central Cascades Crest, West [COA ID: 113]  
Clackamas River and Tributaries [COA ID: 065]  
Coburg Ridge [COA ID: 087]  
Crater Lake [COA ID: 121]  
Hood River [COA ID: 106]  
King Mountain Area [COA ID: 095]  
Little North Santiam River Area [COA ID: 109]  
Lower Sandy River [COA ID: 057]  
McKenzie River Area [COA ID: 114]  
Metolius River Area [COA ID: 127]  
Middle Fork Willamette River [COA ID: 115]

Middlefork Willamette River Headwaters [COA ID: 118]  
Missouri Ridge [COA ID: 070]  
Mt Hood Area [COA ID: 107]  
Mt Jefferson Wilderness, North [COA ID: 111]  
North Umpqua River Area [COA ID: 090]  
Odell Lake-Davis Lake [COA ID: 117]  
One Horse Slough-Beaver Creek [COA ID: 083]  
Pelican Butte-Sky Lakes Area [COA ID: 123]  
Quartzville Creek Area [COA ID: 112]  
Rock Creek [COA ID: 120]  
Santiam Confluences [COA ID: 078]  
Shady Cove Foothills [COA ID: 098]  
Soda Mountain Area [COA ID: 124]  
South Fork Umpqua River and Tributaries [COA ID: 091]  
Umpqua Headwaters [COA ID: 119]  
Upper Deschutes River [COA ID: 129]  
Upper Klamath Lake Area [COA ID: 138]  
Upper Siuslaw [COA ID: 089]  
Upper Willamette River Floodplain [COA ID: 061]  
Wasco Oaks [COA ID: 125]  
Whychus Creek [COA ID: 128]

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## STRATEGY SPOTLIGHT: JIM'S CREEK RESTORATION

### **Restoring a Cultural and Ecological Landscape in the West Cascades Foothills**

The West Cascades foothills once had extensive woodlands and savannas of widely-spaced, large Oregon white oak, ponderosa pine, and Douglas-fir trees with a grass and wildflower understory. Native Americans are thought to have maintained these habitats through the use of fire, which produced forage for big game, improved traveling conditions, and selected for important subsistence plants, such as camas, tarweed, and desert-parsleys.

As a result of changes in fire frequency and intensity after European settlement, Douglas-fir now dominates in many of these areas, and many open woodlands and savannas converted to forests. Almost 95 percent of open oak and pine habitats have been lost in this ecoregion. Currently, remnant patches of oak-pine woodlands and savannas are found on the margins of the Willamette, Umpqua, and Rogue Valleys and some dry, south-facing mid-elevation slopes.

One site with a remnant oak-pine woodland and evidence of Native American use is the area around Jim's Creek on the Willamette National Forest near Oakridge. The site's important ecological and cultural value inspired a comprehensive planning effort to restore some of the oak-pine habitat.

Once a savanna with large, scattered oak, pine, and Douglas-fir trees, the area was transitioning into a dense Douglas-fir forest, jeopardizing the survival of the large heritage ponderosa pine trees. Several of the large ponderosa pines have scars characteristic of bark removal. Native Americans removed the inner bark (cambium) for medicine, so these large trees are considered "medicine trees". However, the large pines were declining in health, and oaks were restricted to the margins of small, rocky openings. Pine and oak trees were not regenerating.

The Willamette National Forest recognized the impending loss of this site and initiated an extensive outreach effort to the communities of Oakridge and Eugene, including political leaders, Native American leaders, the timber industry, and environmental groups to discuss the issues and ask people how they thought the landscape should be managed. Beginning in 2001, stand examinations and ecological studies of current and historical vegetation, small mammal populations, bird species composition, and fish populations were conducted to determine restoration opportunities and to guide management in an adaptive management approach.

In 2007, a Stewardship Contract was awarded to restore about 455 acres in the Jim's Creek Project Area. One aspect of the restoration was removal of most of the younger Douglas-fir that had established as a result of the altered fire regime. The timber harvest portion of the Stewardship Contract was completed in 2012 resulting in approximately \$300,000 in retained receipts that were used to fund additional restoration actions including the reintroduction of prescribed fire, snag creation, and meadow restoration.

The Stewardship Contract activities will be completed in 2015 but periodic maintenance, such as prescribed fire, will likely be necessary to maintain the restored savannah condition.

Although restoration came too late for some pines and oaks in Jim's Creek, most of the mature pines survived, and many remaining oaks are experiencing crown expansion. Numerous ongoing studies of the recovering savannah as well as the grass and wildflower understory will provide a valuable guide to further restoration of oak and pine savannah habitat in this ecoregion.

Restoration often takes time and persistence, but the Jim's Creek project successfully restored an important cultural and ecological landscape, in part due to the time investment in constructing comprehensive partnerships and planning science-based restoration.



*Photo Credit: George Gentry, USFWS*

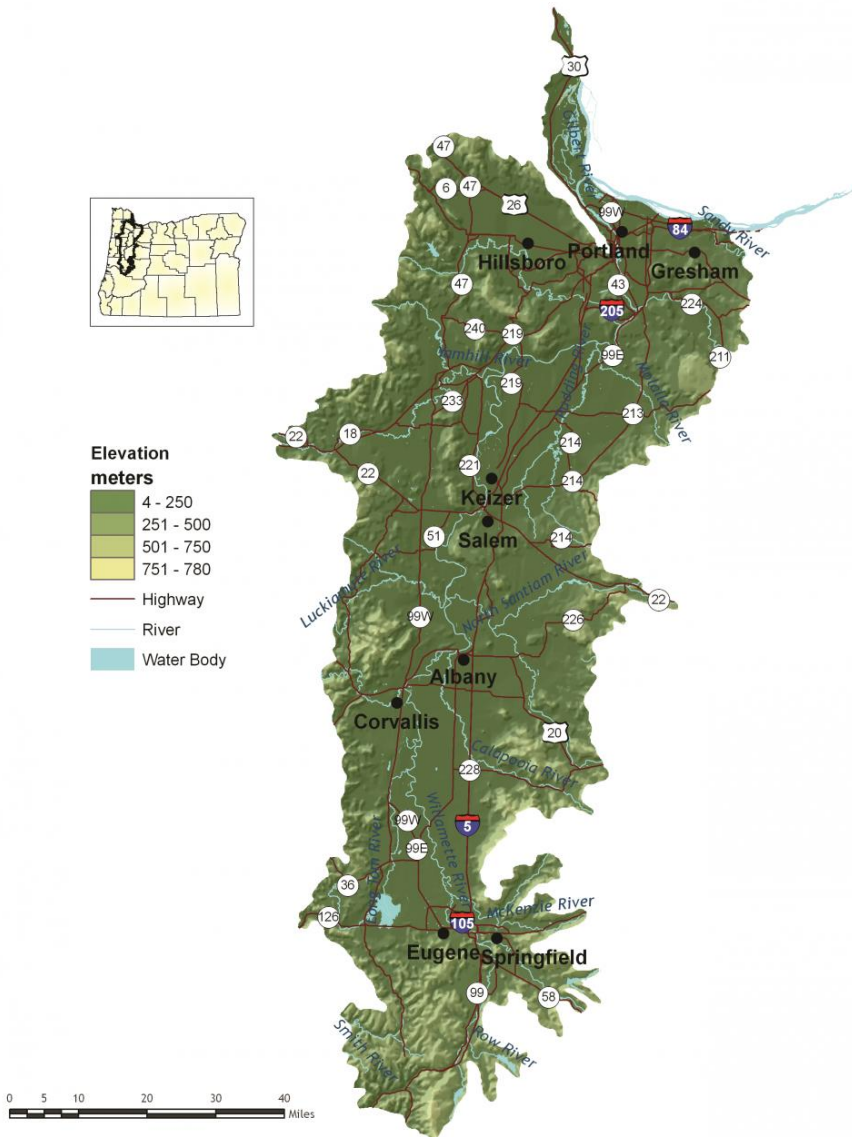
## WILLAMETTE VALLEY

### DESCRIPTION

Bounded on the west by the Coast Range and on the east by the Cascade Range, this ecoregion encompasses 5,308 square miles and includes the Willamette Valley and adjacent foothills. Twenty to 40 miles wide and 120 miles long, the Willamette Valley is a long, level alluvial plain with scattered groups of low basalt hills. Elevations on the valley floor are about 400 feet at the southern end near Eugene, dropping gently to near sea-level in Portland. The climate is characterized by mild, wet winters and warm, dry summers. Fertile soil and abundant rainfall make the valley the most important agricultural region in the state.

Culturally, the Willamette Valley is a land of contrasts. Bustling urban areas are nestled within productive farmland. Traditional industries and high technology contribute to the vibrant economy. With Interstate 5 running its length, the Willamette Valley's economy is shaped by the transportation system and the flow of goods. With 9 of the 10 largest cities in Oregon, the Willamette Valley is the most urban ecoregion in Oregon. It is also the fastest-growing ecoregion. Pressure on valley ecosystems from population growth, land use conversion, and pollution is likely to increase.

## CHARACTERISTICS



### Important Industries

Agriculture, manufacturing, high technology, forest products, construction, retail, services, government, health care, tourism

### Major Crops

Nursery and greenhouse plants, grass seed, wine grapes, Christmas trees, poultry, dairy, vegetables, small fruits and berries, nuts, grains, hops

### **Important Nature-based Recreational Areas**

Forest Park, Bybee and Smith Lakes, Willamette River, Willamette Valley National Wildlife Refuge Complex, Fern Ridge Reservoir

### **Elevation**

4 feet (Columbia River) to 780 feet (near Lowell)

### **Important Rivers**

Willamette, McKenzie, Santiam, Sandy, Mollala, Clackamas, Tualatin, Yamhill, Luckiamute, Long Tom

## **CONSERVATION ISSUES AND PRIORITIES**

The Willamette Valley ecoregion is both the fastest-growing ecoregion in Oregon and the most densely-populated, containing the state's three largest urban centers, Portland, Salem, and Eugene. The population projected for 2050 is approximately four million, nearly double today's population. The ecoregion also provides about half of the state's agricultural sales. It includes 6 of the top 10 agricultural-producing counties, and 16 of the top 17 private sector employers (e.g., manufacturing, high technology, forest products, agriculture, and services).

Historical accounts indicate that prior to European settlement, much of the Willamette Valley was covered by native grasses, forbs, and oak savanna. The Calapooia people regularly set fires to improve hunting and travel. The fires helped to maintain the valley's mosaic of [grasslands](#), [oak savannas](#), [wet prairies](#), and other open habitats.

Since the 1850s, much of the Willamette Valley ecoregion has been altered by development (agricultural and urban), particularly affecting oak woodland, oak savanna, grassland, riverine, and wetland habitats. The Willamette River has been disconnected from its floodplain, and much of the historical habitat has been fragmented. About 96 percent of the Willamette Valley ecoregion is privately-owned, presenting challenges to conservation efforts. Conservation strategies that focus on needs of individual at-risk species and key sites are particularly critical in this ecoregion.

[Key Conservation Issues](#) of particular concern in the Willamette Valley ecoregion include [Land Use Changes](#), [Disruption of Disturbance Regimes](#) (both fire and floodplain function), [Challenges and Opportunities for Private Landowners to Engage in Conservation](#), and [Invasive Species](#). In addition to the statewide factors, specific hazards to wildlife in [urban areas](#) and habitat fragmentation are of conservation concern here.



## LIMITING FACTORS AND RECOMMENDED APPROACHES

### Limiting Factor:

Land Use Conversion and Urbanization

Habitat continues to be lost through conversion to other uses.

### Recommended Approach

Landscape Scale: Because so much of the Willamette Valley ecoregion is privately-owned, voluntary cooperative approaches are the key to long-term conservation using tools such as [financial incentives](#), Candidate Conservation Agreements with Assurances, and conservation easements. Careful [land use planning](#) is also essential. Work with agency partners to support and implement existing land use regulations to preserve farmland, open spaces, recreation areas, and natural habitats. Monitor changes in land uses across the landscape and in land use plans and policies.

Within [Urban Areas](#): Parks and natural areas, wildlife corridors, and green infrastructure can contribute to conservation, connect people to the natural environment, and enhance the quality of life in communities.

### Limiting Factor:

Altered Fire Regimes

Maintenance of open-structured [Strategy Habitats](#), such as [grasslands](#), [oak savannas](#), and [wet prairies](#), is dependent, in part, on periodic burning. Fire exclusion has allowed succession to more forested habitats. Reintroduction of fire poses significant management problems in many areas of the valley. These problems include conflicts with surrounding land use, smoke management, air quality, and safety.

### Recommended Approach

Use multiple tools, including mowing and controlled grazing, to maintain open-structured habitats. Ensure that tools are site-appropriate and implemented to minimize impacts to native species. [Reintroduce fire](#) at locations where conflicts, such as smoke and safety concerns, can be minimized. Work with communities to ensure that air quality and other local concerns are addressed.

### Limiting Factor:

Altered Floodplain

The floodplain dynamics of the Willamette River have been significantly altered. Multiple braided channels dispersed floodwaters, deposited fertile soil, moderated water flow and temperatures, and provided a variety of slow-water habitats, such as sloughs and oxbow lakes. The [Willamette River](#) has largely been confined to a single channel and disconnected from its floodplain.

## Recommended Approach

While restoration of multiple channels may be neither practical nor desirable, cooperative efforts are needed to restore floodplain function and critical off-channel habitats. Using green infrastructure and careful planning for development outside of floodplains can help [maintain floodplain function](#).

### Limiting Factor:

#### Habitat Fragmentation

Habitats for at-risk native plant and animal species are largely confined to small and often isolated fragments, such as roadsides and sloughs. Habitat fragmentation also limits [species' ability to move](#) across the landscape to fulfill life history needs. Opportunities for large-scale protection or restoration of native landscapes are limited. Barriers to large-scale ecosystem restoration include:

- existing development
- growth pressures
- high land costs
- fragmented land ownerships

## Recommended Approach

Broad-scale conservation strategies will need to focus on restoring and maintaining more natural ecosystem processes and functions within a landscape that is managed primarily for other values. This may include an emphasis on more “conservation-friendly” management techniques for existing land uses and restoration of some key ecosystem components, such as river-floodplain connections and [wetland](#) and [riparian habitats](#). “Fine-filter” conservation strategies that focus on needs of individual [Strategy Species](#) and [key sites](#) are particularly critical in this ecoregion.

### Limiting Factor:

#### Invasive Species

Invasive plants and animals disrupt native plant and animal communities and impact populations of at-risk native species.

## Recommended Approach

Emphasize prevention, risk assessment, early detection, and quick control to prevent new [invasive species](#) from becoming fully established. Use multiple site-appropriate tools (e.g., mechanical, chemical, biological) to control the most damaging non-native species. Prioritize efforts that focus on key invasive species in high priority areas, particularly where [Strategy Habitats](#) and [Strategy Species](#) occur. Work with the [Oregon Invasive Species Council](#) and other partners to educate people about invasive species issues and to prevent introductions of potentially high-impact species, such as the zebra mussel. Provide

technical and financial assistance to landowners interested in controlling invasive species on their properties. Promote the use of native species for restoration and revegetation.

**Limiting Factor:**

Wildlife Hazards

Urban landscapes can present a variety of hazards for wildlife, such as bird collisions with windows, impacts due to light pollution, predation and disturbance by pets, collisions with vehicles and power lines, exposure to pesticides and contaminants, and harassment and illegal take of wildlife. These hazards can significantly impact wildlife and undermine habitat conservation efforts.

**Recommended Approach**

Support and promote innovative campaigns and programs to reduce wildlife hazards. Work with municipalizes to develop policies, such as wildlife-friendly building guidelines, wildlife-friendly lighting strategies, and integration of wildlife crossings into transportation plans to reduce hazards. Support research into better understanding of urban wildlife hazards and the management strategies to reduce those hazards. Communities can establish “Adopt a Park” programs where residents volunteer to weed a park instead of applying pesticides. Communities, local governments, and non-profit organizations can promote bird-friendly building design and outreach efforts about the impacts of cats on wildlife.

**STRATEGY SPECIES**

- Acorn Woodpecker (*Melanerpes formicivorus*)
- Bradshaw’s Desert Parsley (*Lomatium bradshawii*)
- Bull Trout, Willamette SMU (*Salvelinus confluentus*)
- California Floater Freshwater Mussel (*Anodonta californiensis*)
- California Myotis (*Myotis californicus*)
- Cascade Torrent Salamander (*Rhyacotriton cascadae*)
- Chipping Sparrow (*Spizella passerina*)
- Chum Salmon, Lower Columbia SMU (*Oncorhynchus keta*)
- Clouded Salamander (*Aneides ferreus*)
- Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*)
- Coho Salmon, Lower Columbia SMU (*Oncorhynchus kisutch*)
- Columbia Torrent Salamander (*Rhyacotriton kezeri*)
- Columbian White-tailed Deer (*Odocoileus virginianus leucurus*)
- Common Nighthawk (*Chordeiles minor*)
- Dusky Canada Goose (*Branta canadensis occidentalis*)
- Eulachon (*Thaleichthys pacificus*)
- Fall Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)
- Fender’s Blue Butterfly (*Icaricia icarioides fenderi*)

Foothill Yellow-legged Frog (*Rana boylei*)  
Fringed Myotis (*Myotis thysanodes*)  
Golden Paintbrush (*Castilleja levisecta*)  
Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)  
Great Spangled Fritillary (*Speyeria cybele*)  
Hoary Bat (*Lasiurus cinereus*)  
Howellia (*Howellia aquatilis*)  
Kincaid's Lupine (*Lupinus oregonus*)  
Monarch Butterfly (*Danaus plexippus*)  
Nelson's Checkermallow (*Sidalcea nelsoniana*)  
Northern Red-legged Frog (*Rana aurora*)  
Northern Spotted Owl (*Strix occidentalis caurina*)  
Olive-sided Flycatcher (*Contopus cooperi*)  
Oregon Chub (*Oregonichthys crameri*)  
Oregon Slender Salamander (*Batrachoseps wrighti*)  
Oregon Vesper Sparrow (*Pooecetes gramineus affinis*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Peacock Larkspur (*Delphinium pavonaceum*)  
Purple Martin (*Progne subis arboricola*)  
Short-eared Owl (*Asio flammeus flammeus*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Southern Torrent Salamander (*Rhyacotriton variegatus*)  
Spring Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Willamette SMU (*Oncorhynchus tshawytscha*)  
Stonefly (*Capnia kersti*)  
Streaked Horned Lark (*Eremophila alpestris strigata*)  
Summer Steelhead / Coastal Rainbow Trout, Lower Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Taylor's Checkerspot Butterfly (*Euphydryas editha taylori*)  
Townsend's Big-eared Bat (*Corynorhinus townsendii*)  
Wayside Aster (*Eucephalus vialis*)  
Western Bluebird (*Sialia mexicana*)  
Western Brook Lamprey (*Lampetra richardsoni*)  
Western Bumble Bee (*Bombus occidentalis*)  
Western Gray Squirrel (*Sciurus griseus*)  
Western Meadowlark (*Sturnella neglecta*)  
Western Painted Turtle (*Chrysemys picta bellii*)  
Western Pond Turtle (*Actinemys marmorata*)  
Western Rattlesnake (*Crotalus oregonus*)  
Western Ridged Mussel (*Gonidea angulata*)

Western River Lamprey (*Lampetra ayresii*)  
White Rock Larkspur (*Delphinium leucophaeum*)  
White-breasted Nuthatch (*Sitta carolinensis aculeata*)  
White-topped Aster (*Sericocarpus rigidus*)  
Willamette Daisy (*Erigeron decumbens*)  
Willow Flycatcher (*Empidonax traillii*)  
Winged Floater Freshwater Mussel (*Anodonta nuttalliana*)  
Winter Steelhead / Coastal Rainbow Trout, Lower Columbia SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Winter Steelhead / Coastal Rainbow Trout, Willamette SMU  
(*Oncorhynchus mykiss* / *Oncorhynchus mykiss irideus*)  
Yellow-breasted Chat (*Icteria virens auricollis*)

## CONSERVATION OPPORTUNITY AREAS

Banks Swamp [COA ID: 062]  
Baskett Butte [COA ID: 072]  
Bull Run-Sandy Rivers [COA ID: 105]  
Calapooia River [COA ID: 082]  
Clackamas River and Tributaries [COA ID: 065]  
Coburg Ridge [COA ID: 087]  
Corvallis Area Forests and Balds [COA ID: 081]  
Crawfordsville Oak-Washburn Butte [COA ID: 085]  
Deer Island [COA ID: 053]  
Dundee Oaks [COA ID: 066]  
Eola Hills [COA ID: 073]  
Finley-Muddy Creek Area [COA ID: 084]  
Forest Park [COA ID: 058]  
Gales Creek [COA ID: 013]  
Habeck Oaks [COA ID: 074]  
Hayden Island-Government Island [COA ID: 055]  
Kings Valley-Woods Creek Oak Woodlands [COA ID: 080]  
Kingston Prairie-Scio Oak Pine Savanna [COA ID: 079]  
Little North Santiam River Area [COA ID: 109]  
Lower Sandy River [COA ID: 057]  
Lower Willamette River Floodplain [COA ID: 059]  
Luckiamute River and Tributaries [COA ID: 075]  
Mary's Peak [COA ID: 028]  
McKenzie River Area [COA ID: 114]  
McTimmons Valley – Airlie Savanna [COA ID: 076]

Middle Fork Willamette River [COA ID: 115]  
Middle Willamette River Floodplain [COA ID: 060]  
Missouri Ridge [COA ID: 070]  
Mohawk River [COA ID: 088]  
Molalla River [COA ID: 069]  
One Horse Slough-Beaver Creek [COA ID: 083]  
Pudding River [COA ID: 068]  
Red Prairie-Mill Creek-Willamina Oaks South [COA ID: 071]  
Salem Hills-Ankeny NWR [COA ID: 077]  
Santiam Confluences [COA ID: 078]  
Sauvie Island-Scappoose [COA ID: 054]  
Scoggins Valley-Mount Richmond [COA ID: 063]  
Siuslaw River [COA ID: 035]  
Smith-Bybee Lakes and Columbia Slough [COA ID: 056]  
Trask Mountain [COA ID: 018]  
Tualatin River [COA ID: 064]  
Upper Siuslaw [COA ID: 089]  
Upper Willamette River Floodplain [COA ID: 061]  
West Eugene Area [COA ID: 086]  
Yamhill Oaks-Willamina Oaks North [COA ID: 067]

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## STRATEGY SPOTLIGHT: WETLAND PRAIRIE RESTORATION

[Wetland Prairie Restoration: An Online Resource](#) is a comprehensive introduction to the history and ecology of wetland prairies in the Willamette Valley and overview of the restoration process.

The online resource is based on the soon-to-be-completed “Practical Guidelines for Wetland Prairie Restoration in the Willamette Valley, Oregon”, which distills 10 years of research and lessons learned in the Willamette Valley region. The restoration guide was developed by the City of Eugene, Lane Council of Governments, and the [Institute for Applied Ecology](#) to share how-to recommendations with wetland restoration practitioners and promote effective wetland conservation. More will be added to the site soon.

The webpage, which is hosted on the [Cascadia Prairie Oak Partnership website](#), was created by students in the University of Oregon’s Environmental Leadership Program, Kathryn Alexander, Kathy Fioretti, and Jeff Kresse, with Environmental Leadership Program Co-Director Peg Boulay. The U.S. Environmental Protection Agency generously provided funding to support the project through a Wetland Program Development Grant.

The newly launched site illustrates the ecology, effective management practices, techniques, and timelines for restoration, as well as results from 14 different restored sites and several field studies. This resource will be of particular interest to wetland prairie managers and restoration practitioners.

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*Photo Credit: Ian Chun*

## NEARSHORE

### DESCRIPTION

Oregon's Nearshore ecoregion offers opportunities for boating, surfing, wildlife viewing, fishing, crabbing, clamming, and recreational pursuits. It supports commercial fish harvests, shipping, and ecosystem services that benefit all Oregonians. The nearshore environment includes a variety of habitats ranging from submerged high-relief rocky reefs to broad expanses of intertidal mudflats in estuaries. It is home to a vast array of fish, invertebrates, marine mammals, birds, algae, plants, and micro-organisms. These habitats and species are integral parts of Oregon's complex nearshore ecosystem, and are interconnected through food webs, nutrient cycling, habitat usage, and ocean currents. They are also influenced by a multitude of other biological, physical, chemical, geological, and human use factors.

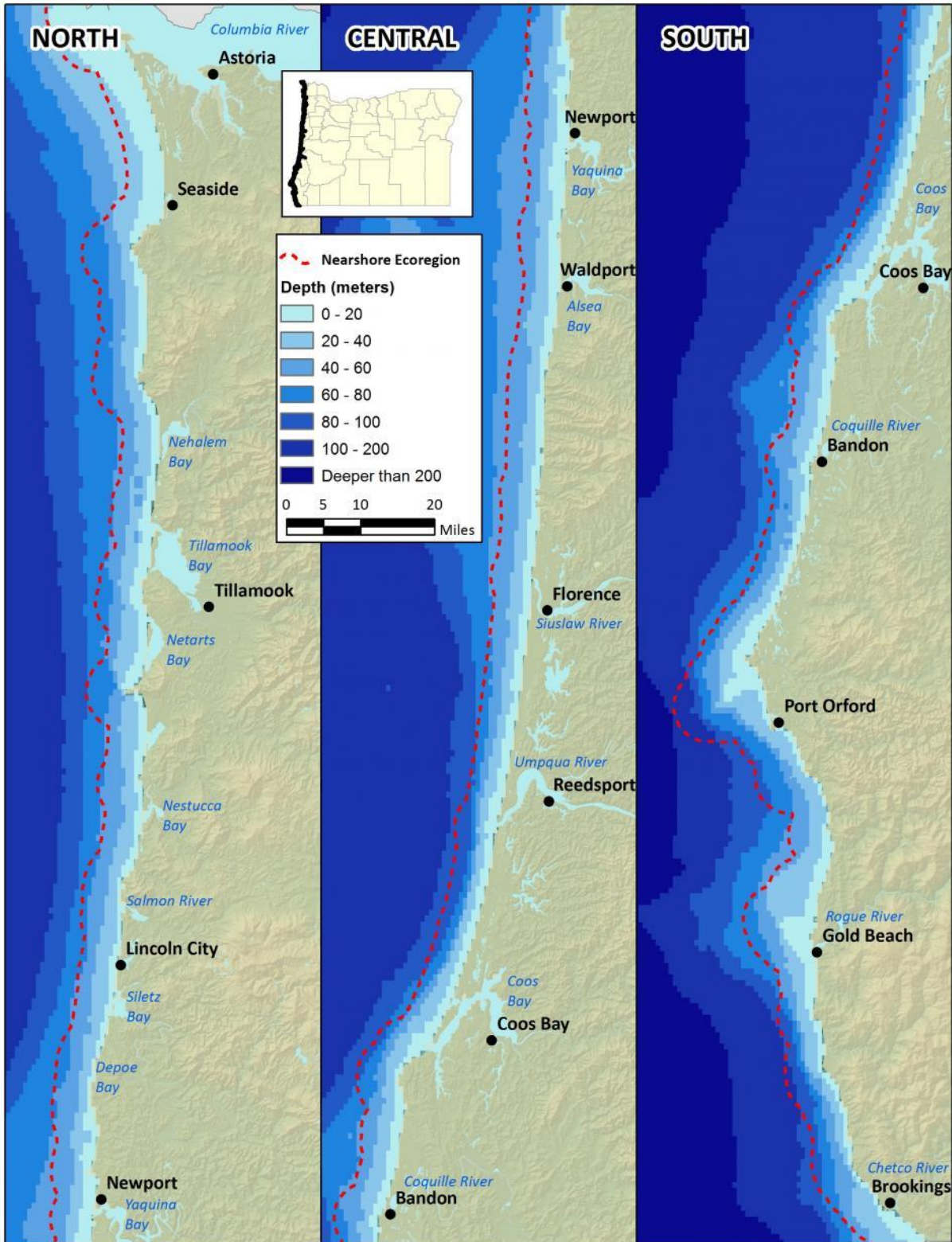
The Nearshore ecoregion encompasses the area from the outer boundary of Oregon's Territorial Sea at 3 nautical miles to the supratidal zone affected by wave spray and overwash at extreme high tides on the ocean shoreline, and up into the portions of estuaries where species depend on the saltwater that comes in from the ocean. The Nearshore ecoregion is bordered by the Coast Range ecoregion on the ocean shores and intersects it in Oregon's estuaries.

Nearshore ocean ecology is influenced by environmental conditions in adjacent estuarine, terrestrial, and freshwater habitats. The nearshore ocean is extensively linked with the atmosphere and the dynamic offshore waters of the California Current Large Marine Ecosystem. It is heavily influenced by human coastal development and populations.

The ODFW's Marine Resources Program has updated the [Oregon Nearshore Strategy](#) to provide a comprehensive, sustainable approach to marine species and habitat management. The Nearshore Strategy addresses marine species, including saltwater fish, shellfish, marine mammals, and seabirds, and their habitats.



# CHARACTERISTICS



### **Important Industries**

Commercial fishing, fish processing, tourism and recreation (including recreational fishing, shellfish harvest, and wildlife viewing), shipping, and retirement services

### **Important Nature-based Recreational Areas**

Open water, subtidal rocky reefs, sandy beaches, rocky intertidal areas, surf zone, estuaries

### **Elevation**

From approximately 10 feet above to 636 feet below sea level

### **Number of Vertebrate Wildlife Species**

226

### **Important Rivers**

Alsea Bay, Chetco River, Columbia River, Coos Bay, Coquille River, Depot Bay, Elks River, Necanicum River, Nehalem Bay, Nestucca Bay, Netarts Bay, Pistol River, Rogue River, Salmon River, Sand Lake, Siletz Bay, Siuslaw River, Sixes River, Tillamook Bay, Umpqua River, Windchuck River, Yaquina Bay

### **Ecologically Outstanding Areas**

Oceanographic influences: California current, seasonal upwelling

## **CONSERVATION ISSUES AND PRIORITIES**

Oregon's ecosystem-based management approach recognizes the role human populations play as a part of ecological systems. As human activities in and around the Nearshore ecoregion increase, human impacts on the fish, wildlife, and their habitats may also increase. Of Oregon's 33 coastal cities, 12 are active ports supporting vessel traffic to and from ocean waters, and all are an integral part of coastal ecology. Coastal development, tourism, recreation, sport and commercial fishing, dredging, wastewater disposal, aquaculture, and energy development are just a few nearshore resource uses that benefit human communities. However, along with the benefits, there are potentially adverse effects on nearshore resources. Proactive management and planning are needed to anticipate and avoid or minimize negative environmental consequences of human activities.

Oregon's nearshore environment is a public domain that is managed in trust by the State of Oregon, and as such, conservation of nearshore resources requires collaboration among a broad range of management agencies and public user groups. The state's management of nearshore fish and wildlife resources falls mainly under the purview of the ODFW. Human use issues, such as water pollution, vessel traffic, or access to public lands, are managed by other state agencies, local governments, tribal governments, and federal entities. For more information about jurisdictional boundaries and authority

within Oregon’s nearshore environment, see the [“Agency Programs and Authorities in Oregon’s Nearshore Area” diagram in the Oregon Nearshore Strategy.](#)

To balance human use benefits with conservation concerns, many management actions are designed to maintain access to natural resources while preventing serious depletion or damage. Natural resource management must also account for the needs of both present and future generations, which requires taking a long-term view. To meet these goals, the Oregon Nearshore Strategy recommends 12 conservation and management priority actions. These actions address nearshore issues that are in need of immediate or timely attention, are feasible to implement given appropriate funding, and have received some level of public support. There are three general categories of action: 1) education and outreach, 2) research and monitoring, and 3) management and policy. The conservation of marine resources is the responsibility of all users, to ensure the long-term productivity of marine ecosystems. Several selected opportunities for conservation, education, research, and management based on the 12 recommendations within the Oregon Nearshore Strategy are listed below.

## LIMITING FACTORS AND RECOMMENDED APPROACHES

### **Limiting Factor:**

Public Awareness of Nearshore Marine Species and Habitats

Most marine species and habitats occur below the water’s surface and go unseen by most members of the public. Education and outreach efforts are needed to increase public awareness about nearshore marine species and habitats, as well as the issues affecting them.

### **Recommended Approach**

Improve education and outreach efforts to disseminate information on species identification and distribution, management regulations, and release techniques designed to reduce discard mortality. Develop curriculum materials and provide information to schools for use in classrooms. Continue to improve the appearance, visibility, and effectiveness of the ODFW Marine Resources Program website. Employ emerging technologies, blogs, and social media sites. Use local newspapers and literature to share research and conservation actions with adults and children. Display conservation and educational materials at hotels, charter offices, angling shops, real estate offices, malls, parks, marinas, boat ramps, beach access points, and other public areas. Encourage development of local and port groups to facilitate information and knowledge exchange between agencies and local constituents. Design and convene workshops tailored to educate the public on specific topics (e.g., fish, algae, shellfish, non-native species identification workshops). Involve members of the public in management of nearshore marine resources, conduct regular updates to the Oregon Nearshore Strategy, and ensure that management priorities are congruent with public needs.

**Limiting Factor:****Habitat Alteration**

Disturbance to, or loss of, habitat important to nearshore species and ecosystems can occur from both direct and indirect sources. Disturbances to vulnerable intertidal habitats are often subtle and can be a consequence of human activities that cause light or noise pollution or result in trampling of intertidal habitats, animals, or plants. Intertidal and submerged habitats are impacted by changes to sediment transport due to altered hydrology, coastal development, shoreline armoring, beach grooming, global climate change, and many other factors. Non-native species introductions may alter physical properties and habitat-forming biological communities (e.g., crowding out native organisms that function as substrate for other organisms) in nearshore habitats. Certain bottom fishing methods may reduce structural diversity of the sea floor and change benthic communities.

**Recommended Approach**

Continue to monitor nearshore species and habitats to document impacts that may be subtle or may accumulate over time, and to determine areas where disturbance is causing, or could cause, negative impacts to species or habitat. Collaborate with academic and management entities in the study of non-native species, survey intertidal and subtidal habitats for presence, set a baseline of habitat use, and monitor communities for potential spread. Investigate alternative methods (e.g., fishing techniques, shoreline erosion control, development practices) that reduce or remedy negative impacts on nearshore habitats. Inform the public about the use of non-disturbing methods appropriate for viewing marine wildlife. Provide new or improved interpretive signage, media inserts, feature articles and booklets about intertidal habitats, fisheries information, and other nearshore ocean resources.

**Limiting Factor:****Water Quality Degradation**

Water quality degradation caused by human activities or natural causes may impact nearshore species and habitats. Water quality within the nearshore ocean is affected by coastal and inland development, either from increased runoff of contaminated water or increased water temperature resulting from altered hydrology or depth (e.g., dredging, filling). Boating activity in nearshore waters or adjacent estuaries may lead to accumulation of oil in surface waters from poorly-maintained or failing equipment. Water quality may be further degraded if conditions support significant blooms of harmful algae, which can lead to highly concentrated marine biotoxins.

**Recommended Approach**

Coordinate with the multiple state and federal agencies involved in water quality issues to update and improve signage at marinas and public beaches to inform boaters and beach users about water quality issues and methods for reporting problems. Develop incentive programs to encourage boaters to use

environmentally-friendly gear or equipment. Prevent contamination and enforce laws regarding pollution and water quality issues. Monitor for harmful algal blooms to diagnose potential indications of domoic acid or paralytic shellfish poisoning.

**Limiting Factor:**

Harvest Issues

Populations of nearshore species may be impacted by commercial or recreational overharvest at local or at broader scales, as well as through bycatch and discard of non-targeted species. Accurate accounting of stock abundance and harvest impacts is an important component of sustainable resource management. Abundance estimates and complete life history information remain unknown for many nearshore species.

**Recommended Approach**

Provide opportunities for protecting and enhancing nearshore fisheries stocks. Develop and implement fish release methods designed to minimize discard mortality. Increase ODFW representation at sportsmen shows, festivals, and other venues, encourage fishers to avoid vulnerable species, and make information about proper discard techniques widely available. Develop monitoring, conservation, resource analyses, and harvest management plans for commercially and recreationally harvested shellfish. Evaluate immediate and long-term conservation and harvest management needs for Oregon's recreational and commercial nearshore fisheries. Develop stock assessment and/or stock status indicator strategies for priority nearshore groundfish and shellfish species, designed to accommodate the unique circumstances and habitats of nearshore species with the greatest management need. Develop fishery-independent survey methodologies and gather baseline information for all key nearshore species. Review the Strategy Species list to identify priority species in need of conservation plans under Oregon's Native Fish Conservation Policy. Collaborate with sport and commercial fishermen, university researchers, and others to gather imperative information for exploited nearshore stocks. Sponsor socioeconomic analysis of coastal communities to determine the relationship between stock status and direct (e.g., fishing) or indirect (e.g., tourism) impacts from various industries.

**Limiting Factor:**

Monitoring and Research Needs

Monitoring species and habitat changes will help evaluate resource status and trends over the long-term. Although some monitoring is done at present, more is needed to examine changes and trends within Oregon's nearshore ecosystem. More data are needed to understand local and regional ecological changes due to predator-prey population dynamics, the introduction of non-native species, algae blooms, climate change, and ocean acidification effects and other changes. Many aspects of Oregon's nearshore habitats and species are poorly understood. For many marine species, substantial data gaps exist with regards to population structure, life history parameters, response to environmental

change, and species-habitat associations. Similarly, while significant strides have been made toward describing and mapping nearshore habitats, gaps remain for parts of the nearshore area. In addition, researchers are still accumulating data to describe the physical properties and biological component of certain habitat types, and to provide long-term information on the physical response of nearshore systems to climate change. More information is needed to assess and understand the complexity of the nearshore ecosystem and the effects of human interactions.

### **Recommended Approach**

Encourage and assist in monitoring the population dynamics and habitat usage of rocky reef-associated species. Research the movement, behavior, and predator-prey relationships of adult and juvenile stages of nearshore species. Identify and evaluate conflicts between marine mammals and fisheries. Inventory and monitor non-native species. Public users should inspect boats, clothing, and equipment for non-native species before and after use of natural areas or waterbodies, and should report sightings to support ongoing monitoring of species distribution. Assess and gather baseline information on levels of human use and disturbances to intertidal habitats, animals, and plants. Review coastal development plans and regulations to identify opportunities to address areas with consequent negative impacts to nearshore resources. Improve and expand the capabilities of research and monitoring programs to meet the requirements of the Native Fish Conservation Policy and other nearshore resource management programs. Investigate the effects of environmental changes on nearshore species and habitats. Continue to study, evaluate, and monitor harmful algal blooms to provide an early warning system for blooms. Continue to develop non-lethal habitat surveys of nearshore habitats, and collaborate with interested stakeholders to increase survey coverage.

### **Limiting Factor:**

#### Estuarine Management Planning Needs

Estuaries are essential habitat for certain life stages of many recreationally and commercially important marine species. Estuaries are linked to the nearshore ocean through the movement of water, nutrients, sediments, animals, and plants, as well as human activities. Estuarine habitat and species are made especially vulnerable to human-induced environmental changes due to their proximity to human activity. While some aspects of estuarine resources are described elsewhere in the Oregon Conservation Strategy, planning and information regarding the marine components of Oregon's estuaries and the marine-estuarine connection are needed.

### **Recommended Approach**

Develop and implement science-based management strategies for estuarine resources. Develop key strategic plans under the guidance of the Native Fish Conservation Policy for estuarine species with the greatest need. Develop conservation and harvest management plans for commercially and recreationally harvested shellfish. Expand upon management objectives previously identified, and further develop plans that identify restoration or conservation targets for individual estuaries.

Encourage and assist in estuarine research to identify data and knowledge needed for management planning.

## STRATEGY SPECIES

Big Skate (*Raja binoculata*)  
Black Brant (*Branta bernicla nigricans*)  
Black Oystercatcher (*Haematopus bachmani*)  
Black Rockfish (*Sebastes melanops*)  
Blue Mud Shrimp (*Upogebia pugettensis*)  
Blue Rockfish (*Sebastes mystinus*)  
Brown Pelican (*Pelecanus occidentalis californicus*)  
Brown Rockfish (*Sebastes auriculatus*)  
Bull Kelp (*Nereocystis luetkeana*)  
Cabezon (*Scorpaenichthys marmoratus*)  
California Mussel (*Mytilus californianus*)  
Canary Rockfish (*Sebastes pinniger*)  
Caspian Tern (*Hydroprogne caspia*)  
China Rockfish (*Sebastes nebulosus*)  
Chum Salmon, Coastal SMU (*Oncorhynchus keta*)  
Chum Salmon, Lower Columbia SMU (*Oncorhynchus keta*)  
Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*)  
Coho Salmon, Coastal SMU (*Oncorhynchus kisutch*)  
Coho Salmon, Klamath SMU (*Oncorhynchus kisutch*)  
Coho Salmon, Lower Columbia SMU (*Oncorhynchus kisutch*)  
Coho Salmon, Rogue SMU (*Oncorhynchus kisutch*)  
Copper Rockfish (*Sebastes caurinus*)  
Deacon Rockfish (*Sebastes diaconus*)  
Dungeness Crab (*Metacarcinus magister*)  
Eulachon (*Thaleichthys pacificus*)  
Fall Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)  
Fall Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Fall Chinook Salmon, Snake SMU (*Oncorhynchus tshawytscha*)  
Flat Abalone (*Haliotis walallensis*)  
Fork-tailed Storm-Petrel (*Oceanodroma furcata*)  
Grass Rockfish (*Sebastes rastrelliger*)  
Gray Whale (*Eschrichtius robustus*)  
Green Sturgeon, Northern DPS (*Acipenser medirostris*)  
Green Sturgeon, Southern DPS (*Acipenser medirostris*)  
Harbor Porpoise (*Phocoena phocoena*)

Kelp Greenling (*Hexagrammos decagrammus*)  
Killer Whale (*Orcinus orca*)  
Leach's Storm-Petrel (*Oceanodroma leucorhoa leucorhoa*)  
Lingcod (*Ophiodon elongatus*)  
Longfin Smelt (*Spirinchus thaleichthys*)  
Marbled Murrelet (*Brachyramphus marmoratus*)  
Native Eelgrass (*Zostera marina*)  
Native Littleneck Clam (*Leukoma staminea*)  
Northern Anchovy (*Engraulis mordax*)  
Northern Elephant Seal (*Mirounga angustirostris*)  
Ochre Sea Star (*Pisaster ochraceus*)  
Olympia Oyster (*Ostrea lurida*)  
Pacific Giant Octopus (*Enteroctopus dofleini*)  
Pacific Harbor Seal (*Phoca vitulina*)  
Pacific Herring (*Clupea pallasii*)  
Pacific Lamprey (*Entosphenus tridentatus*)  
Pacific Sand Lance (*Ammodytes hexapterus*)  
Pile Perch (*Rhacochilus vacca*)  
Purple Sea Urchin (*Strongylocentrotus purpuratus*)  
Quillback Rockfish (*Sebastes maliger*)  
Razor Clam (*Siliqua patula*)  
Red Abalone (*Haliotis rufescens*)  
Red Sea Urchin (*Mesocentrotus franciscanus*)  
Redtail Surfperch (*Amphistichus rhodotus*)  
Rock Greenling (*Hexagrammos lagocephalus*)  
Rock Sandpiper (*Calidris ptilocnemis tschuktschorum*)  
Rock Scallop (*Crassadoma gigantea*)  
Sea Palm (*Postelsia palmaeformis*)  
Shiner Perch (*Cymatogaster aggregata*)  
Spiny Dogfish (*Squalus acanthias*)  
Spring Chinook Salmon, Coastal SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Lower Columbia SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Lower Snake SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Mid Columbia SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Rogue SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Upper Snake SMU (*Oncorhynchus tshawytscha*)  
Spring Chinook Salmon, Willamette SMU (*Oncorhynchus tshawytscha*)  
Starry Flounder (*Platichthys stellatus*)  
Steller Sea Lion (*Eumetopias jubatus*)  
Striped Perch (*Embiotoca lateralis*)



Sunflower Star (*Pycnopodia helianthoides*)  
Surf Grass (*Phyllospadix* spp.)  
Surf Smelt (*Hypomesus pretiosus*)  
Tiger Rockfish (*Sebastes nigrocinctus*)  
Topsmelt (*Atherinops affinis*)  
Tufted Puffin (*Fratercula cirrhata*)  
Vermilion Rockfish (*Sebastes miniatus*)  
Western River Lamprey (*Lampetra ayresii*)  
Western Snowy Plover (*Charadrius nivosus nivosus*)  
White Sturgeon (*Acipenser transmontanus*)  
Wolf-eel (*Anarrhichthys ocellatus*)  
Yelloweye Rockfish (*Sebastes ruberrimus*)  
Yellowtail Rockfish (*Sebastes flavidus*)

## CONSERVATION OPPORTUNITY AREAS

### STRATEGY SPOTLIGHT: CONSERVATION OPPORTUNITIES IN THE NEARSHORE ECOREGION

Oregon's nearshore environment is public domain, and opportunities for public participation in conservation and management of nearshore resources are present throughout the entire Nearshore ecoregion. For the other eight ecoregions, Conservation Opportunity Areas (COAs) were developed to guide voluntary, non-regulatory actions to benefit habitats where broad fish and wildlife conservation goals could be best met. Although conservation actions to benefit Strategy Species and Habitats are important regardless of location, focusing investments in certain priority areas can improve funding efficiency and promote cooperative efforts across management areas. For the eight terrestrial ecoregions, COAs were selected using extensive data analysis, spatial modeling, and a MARXAN analysis with specific goals for many of the Strategy Species and Habitats ([see COA methodology](#)). However, the COA analyses did not include most of the spatial area of the Nearshore ecoregion, its Strategy Species, or Habitats because data were insufficient to support this approach. Although 23 COAs identified in the Coast Range ecoregion include estuarine and/or ocean shoreline areas that are part of the Nearshore Ecoregion, those COAs are not listed in this section as the methodology and analyses were not designed to address all of the Nearshore Strategy Species and Habitats. Designation of specific COAs in the Nearshore ecoregion may be considered in the future as more information on the distribution of species, habitats, and other needed information becomes available. Locations of potential conservation areas would only be established following opportunities for public involvement in the development process.