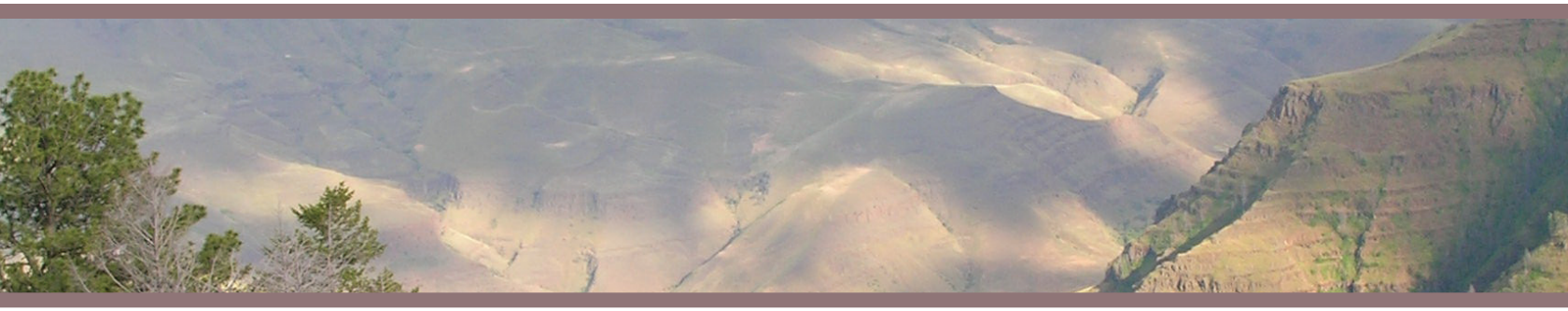


Photo © Martin Nugent

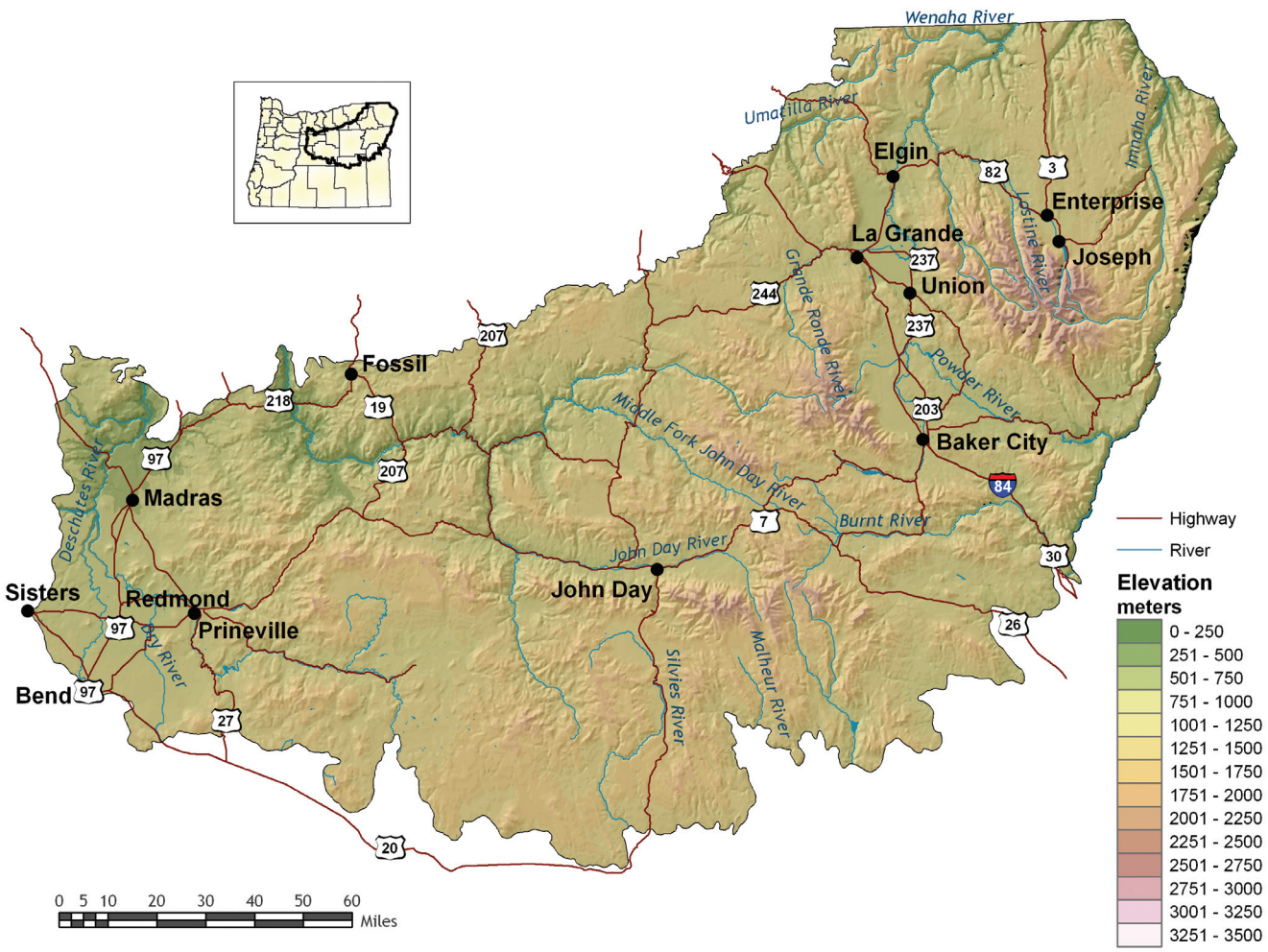
# Blue Mountains Ecoregion

## Getting to Know the Blue Mountains Ecoregion

### *Characteristics*

At 23,984 square miles, the Blue Mountains ecoregion is the largest ecoregion in Oregon. Although named for its largest mountain range, the Blue Mountain ecoregion is a diverse complex of mountain ranges, valleys and plateaus that also extends beyond Oregon into the states of Idaho and Washington. There are deep rocky-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 or 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



## *"At a Glance"- Characteristics and Statistics*

**Land use (% of ecoregion):**

| | |
|---|---|
| Agriculture | 1.3% |
| Forest and woodland | 40.3% |
| Other (lakes, wetlands, cliffs, etc.) | 18.3% |
| Range, pasture, and grassland | 39.9% |
| Towns and rural residential | 0.1% |
| Urban and suburban | 0.1% |

**Land ownership:**

| | |
|---|---|
| Private | 46% |
| Public, federal | 52% |
| Public, state and local | <1% |
| Native American | 1% |

**Human population, government and transportation statistics:**

| | |
|---|---|
| Estimated population in 2000 | 161,000 |
| % of Oregon's population in 2000 | 4.8% |
| Number of cities | 41 |
| Number of counties | 14 |
| *(includes part of Baker, Crook, Deschutes, Harney, Jefferson, Lake, Malheur, Morrow, Wasco, Wheeler, Umatilla, counties and all of Grant, Union and Wallowa counties)* | |
| Number of watershed councils | 16 |
| *(A watershed council is considered present if at least 10% of its area is located within the ecoregion.)* | |
| Miles of road | 40,900 |

**Economics:**

***Important industries:*** Agriculture, livestock (beef cattle, dairy cattle, sheep, poultry, and hogs), forest products, manufacturing, recreation (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).

**Ecology:**

| | |
|---|---|
| Average annual precipitation | 8.00" – 24.29" (snowfall 11.21" - 87.63") |
| Average July high temperature (1971-2000) | 75.9 ºF – 90.8 ºF |
| Average January low temperature (1971-2000) | 9.9 ºF – 28.1 ºF |
| Elevation | 1,000 feet (Snake River) – 9,838 feet (Sacajawea Peak) |
| Number of regularly occurring vertebrate wildlife species | 345 |
| Important rivers | Deschutes, Grande Ronde, Imnaha, John Day, Malheur, Powder, Silvies, Snake, Umatilla, Wallowa |

*Information Sources: Oregon Blue Book (2003-04), Oregon Climate Service data (1971-2000), Oregon State of the Environment Report (2000), Oregon Watershed Enhancement Board (2001), Oregon Wildlife Diversity Plan (1993), U.S. Census Bureau (2000).*

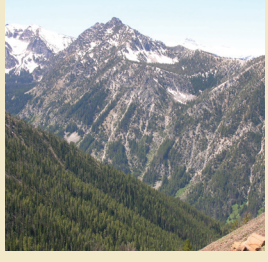


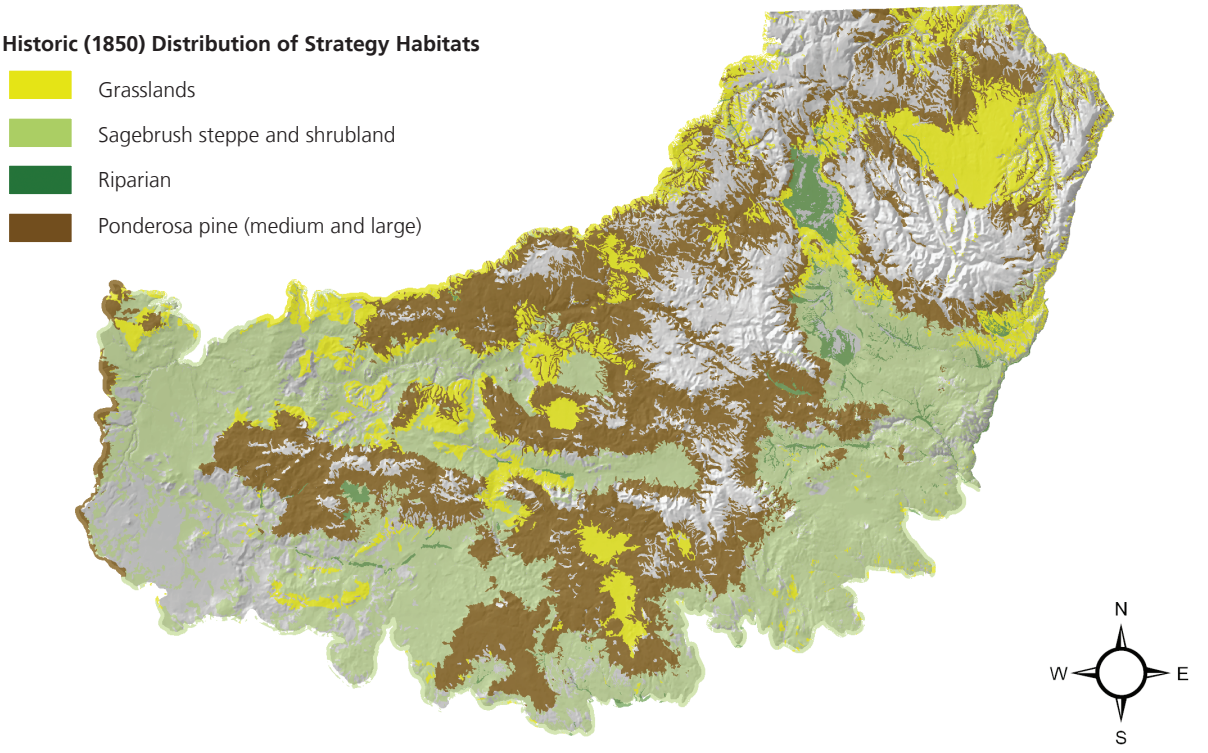
Photo © Martin Nugent

### *Summary List of Strategy Habitats*

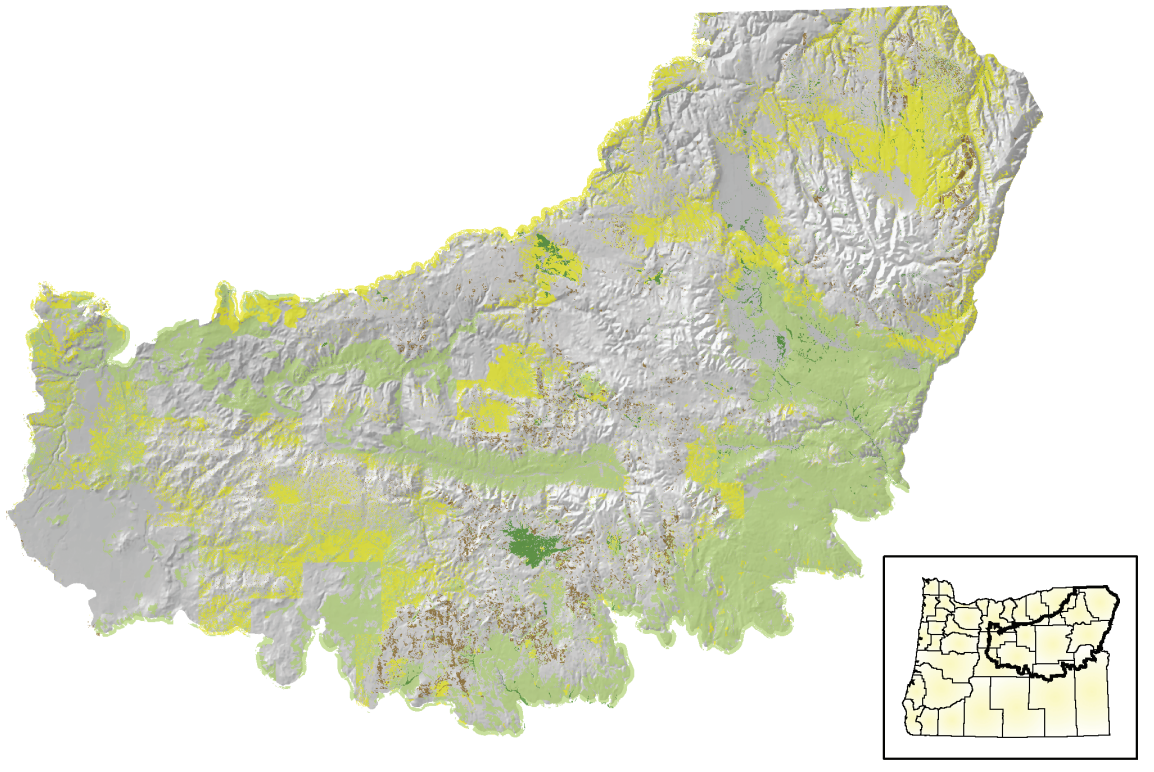
Strategy Habitats in the Blue Mountains Ecoregion include: ponderosa pine woodlands, aspen woodlands, grasslands, sagebrush steppe and shrublands, wetlands, riparian, and aquatic habitats.

### *Change in Strategy Habitats*

**Historic (1850) Distribution of Strategy Habitats**




**Current (2004) Distribution of Strategy Habitats**



*Data Source: Oregon Natural Heritage Information Center, 2004.*

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 places in the state, along with the cities of La Grande, Baker, Enterprise, and John Day.

## Conservation Issues and Actions

### Overview

While the Blue Mountain 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 resulted in undesirable changes in vegetation that has increased vulnerability of forests to insects, disease, and uncharacteristically severe wildfire. Similarly, these changes have lead to increased invasive species and increased vulnerability to wildfire in sagebrush shrublands and steppe.

Habitat loss and potential habitat loss are greatest in lower elevation valley bottom habitats (e.g., riparian, wetlands, shrublands), where native vegetation has been converted to agricultural uses. These low-elevation habitats are highly fragmented, and, maintaining connectivity and corridors for wildlife is important in these areas. Increasing recreational pressure and invasive species can potentially impact all habitats in this ecoregion.

### Ecoregion-level limiting factors and recommended approaches

All six of the key conservation issues apply statewide, as do the approaches outlined in the Statewide Perspectives and Approaches chapter. However, invasive species, altered disturbance regimes and land use changes are described further in this section, considering the Blue Mountains' ecoregional characteristics. In addition to the statewide issues, uncontrolled off-highway recreational vehicle use is of increasing concern in this ecoregion.

**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

### Summary List of Strategy Species

**Mammals**

- American marten
- California myotis (bat)
- Fringed myotis (bat)
- Hoary bat
- Long-legged myotis (bat)
- Pallid bat
- Silver-haired bat
- Spotted bat
- Townsend's big-eared bat

**Birds**

- American three-toed woodpecker
- Black-backed woodpecker
- Bobolink
- Ferruginous hawk
- Flammulated owl
- Great gray owl
- Greater sage-grouse
- Lewis' woodpecker
- Loggerhead shrike
- Pileated woodpecker
- Upland sandpiper
- White-headed woodpecker

**Fish**

- Bull trout *(Columbia Distinct Population Segment [DPS])*
- Chinook *(Snake River ESU, spring/summer run)*
- Chinook *(Snake River ESU, fall run)*
- Inland Columbia Basin redband trout
- Malheur mottled sculpin
- Margined sculpin
- Oregon Basins redband trout *(Silvies River)*
- Pacific lamprey
- Steelhead *(Middle Columbia River ESU, summer run)*
- Steelhead *(Middle Columbia River ESU, winter run)*
- Steelhead *(Snake River Basin ESU)*
- Western brook lamprey
- Westslope cutthroat trout

**Plants**

- Arrow-leaf thelypody
- Cusick's lupine
- Greenman's desert parsley
- Howell's thelypody
- MacFarlane's four-o'clock
- Oregon semaphore grass
- Peck's milk-vetch
- Red-fruited desert parsley
- Snake River goldenweed
- South Fork John Day milk-vetch
- Spalding's campion

**Amphibians and Reptiles**

- Columbia spotted frog
- Inland tailed frog
- Western painted turtle
- Western toad

**Invertebrates**

*Aquatic snails:*

- Bulb juga
- Purple-lipped juga (Dechutes juga)

Douglas-fir and true firs, the forests are at increased risk of severe wildfire, disease, and damage by insects. Native shrublands and grasslands are more susceptible to the spread of juniper. 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 restore habitats but require careful planning to provide sufficient habitat features that are important to wildlife (e.g., snags, down logs, hiding cover for big game). Similarly, wildfire reforestation efforts should be carefully planned to create stands with tree diversity, understory vegetation and natural forest openings

**Approach:** Use an integrated approach to forest health issues that considers historic 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 needed by wildlife, such as snags and down 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 efforts and use adaptive management techniques to ensure efforts are meeting habitat restoration and wildfire prevention objectives with minimal impacts on wildlife.

**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, dry forests, wetlands, and shrublands are mostly on private lands. Most remnant low-elevation fish and wildlife habitats occur as fragmented patches with poor connectivity.

**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.

**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 places in 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.

**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.

**Factor: Recreational vehicle use.** Use by off-highway vehicles (OHVs) has increased dramatically, with permits doubling statewide during 1999-2004. 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 forests roads can affect wildlife behavior and distribution, depending on road type and traffic levels.

**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., current 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, see USFS Draft Travel Management Plan). Close 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.

**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 as well. 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.

# Invasive Non-native Species

Invasive species currently are considered to be one of the primary causes of species becoming threatened and endangered, second only to habitat conversion. Many species are as threatening to people's livelihoods as they are to fish, wildlife and their habitats. This section identifies the species with the greatest current and potential impact in the Blue Mountains. These species were determined through an analysis of Oregon Department of Agriculture's Noxious Weed List, ODFW's Wildlife Integrity Rules, ODFW's Introduced Fish Management Strategies report, information from Portland State University Center for Lakes and Reservoirs, and local expert review. Although some of these species also cause significant economic damage to farms, ranches, and managed forests, this list is focused on those that cause the most severe ecological damage. Impacts from introduced game fish vary from species to species and within ecoregions. As a result, the impacts need to be evaluated more locally (ODFW Introduced Fish Management Strategies Report).

## *Known invasive non-native animal and plant species*

These species are established or documented in this ecoregion, and are known to impact native fish and wildlife populations and habitats. They may range from small, controllable populations to widespread infestations.

### *Documented Invasive Animals*

- Atlantic salmon
- Brown bullhead
- Bluegill
- Brook trout
- Bullfrog
- Bullhead catfish
- Carp
- Channel catfish
- Crappie
- Easter gray squirrel
- Eastern fox squirrel
- European red fox
- European starling
- Fathead minnow
- Feral pig
- Feral horse
- Golden Shiner
- House sparrow
- Lake trout
- Largemouth bass
- Mosquito fish (*Gambusia*)
- Mute swan
- Norway rat
- Nutria
- Perch
- Smallmouth bass
- Sunfishes
- Utah chub
- Virginia opossum
- Walleye
- Yellow perch

### *Documented Invasive Plants*

- Barbed goatgrass
- Black locust
- Bloodrop/Pheasant eye
- Bouncing bette
- Buffalo bur
- Cheatgrass
- Clary sage
- Common bugloss
- Common cockle bur
- Common crupina
- Dalmation toadflax
- Dyers woad
- False hoary allysum
- Foxtail
- Himalayan blackberry
- Hungarian brome
- Jointed goatgrass
- Knapweeds (diffuse, meadow, squarrose, Russian)
- Knotweeds (Japanese, giant)
- Lambsquarter
- Leafy spurge
- Marsh elder
- Mediterranean sage
- Medusahead rye
- Mullein
- Myrtle spurge
- North Africa grass
- Orange hawkweed
- Oxeye daisy
- Perennial pepperweed
- Plumeless thistle
- Purple loosestrife
- Rush skeletonweed
- Russian olive
- Sulfur cinquefoil
- Tamarisk (salt cedar)
- Tansy ragwort
- Thistles (musk, plumeless, Scotch, Russian)
- Tree of Heaven
- Whitetop
- Yellow starthistle
- Yellow toadflax

## *Non-native animals and plants of potential concern*

Preventing the establishment of invasive non-native species is far more cost-effective and practical than trying to eradicate them once they are established. To make the best use of financial and personnel resources, prevention efforts need to be prioritized to address the greatest threats, especially since many non-native species do not pose a significant threat to fish and wildlife populations and habitats. Potentially harmful non-native species can be identified by examining biological factors, potential impacts and invasion patterns in similar climates. The species listed here are included because: 1) they are not known to occur in this ecoregion, but could pose a threat to fish and wildlife populations and habitats if they become established; or 2) they are known to occur in this ecoregion but the extent to which they impact native species and disrupt ecological processes is unclear at this time.

### *Potentially Invasive Non-native Animals*

- Asian carp (bighead, silver)
- Asiatic clam
- Chinese fine-scaled loach
- Grass pickerel
- Muskellunge, northern pike
- New Zealand mud snail
- Oriental weatherfish
- Round goby
- Ruffe
- Snakeheads
- Zebra mussel

### *Potentially Invasive Non-native Plants*

- African rue
- King devil weed
- Skeletonleaf bursage
- Syrian bean caper
- Texas blueweed
- Yellow hawkweed

### *Conservation actions in the Blue Mountains Ecoregion identified through other planning efforts*

Landowners and land managers can benefit a variety of fish and wildlife species by managing and restoring Strategy Habitats. The following recommendations are relevant to Strategy Habitats. They were identified through a review of existing plans.

| Actions | Strategy Habitat and General Location | Source Document |
|---|---|---|
| In cooperation with interested landowners and agencies, initiate grassland restoration on private and public land and secure conservation status for ponderosa pine habitats. | Ponderosa pine and grassland habitats throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [recommended targets: Wallowa Plateau and County 15,000 ac; Malheur Headwaters 15,000 ac; John Day River 20,000 ac; North Fork Crooked River 32,000 ac; Aldrich Mts 30,000 ac; King Mt. 35,000 ac;Emigrant Creek/Silver Creek 100, 000 ac] |
| In cooperation with interested landowners and agencies, manage ponderosa pine stands to maintain conditions suitable for white-headed woodpecker | Ponderosa pine habitats throughout ecoregion | OR-WA Partners in Flight – Northern Rocky Mountains Conservation Strategy (Altman 2000) [recommended targets: At appropriate sites, five patches of ponderosa pine habitat more than 5,000 acres each] |
| In cooperation with interested landowners and agencies, initiate sagebrush steppe and shrubland restoration on private and public land and secure conservation status for grasslands. | Sagebrush steppe and shrubland grassland habitats throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [recommended targets: Crooked River National Grasslands 50,000 ac; High Desert South Fork Crooked River 600,000 ac; Powder River 100,000 ac |
| In cooperation with interested landowners and agencies, initiate grassland restoration where needed on private and public land and secure conservation status for grasslands. | Grassland habitats throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [Wallowa Plateau and County 300,000 ac; Malheur Headwaters 9,000 ac] |
| In cooperation with interested landowners and agencies, initiate wet meadow restoration on private and public land and secure conservation status for wet meadows. | Wet meadows habitats throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [recommended targets: Malheur Headwaters 2,000 ac; John Day River 2,000 ac; North Fork Crooked River 5,000 ac; High Desert South Fork Crooked River 5,000 ac; Burnt River 5,000 ac; Powder River - 10,000 acres; Upper Grand Ronde 5,000 ac] |
| In cooperation with interested landowners and agencies, initiate emergent marsh restoration on private and public land and secure conservation status for emergent marshes | Emergent marshes throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [recommended targets: South Fork Crooked River 500 ac; Upper Grande Ronde 2,000 ac] |
| In cooperation with interested landowners and agencies, initiate riparian restoration on private and public land and secure conservation status for riparian habitats. | Riparian habitats throughout the Blue Mountains ecoregion | OR-WA Partners in Flight – Northern Rocky Mountains Conservation Strategy (Altman 2000) [recommended targets: >more than 30% of historical extent throughout ecoregion] |
| In cooperation with interested landowners and agencies, initiate riparian forest restoration on private and public land and secure conservation status for riparian forests. | Riparian habitats throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [recommended targets: Wallowa Plateau and County 1,000 ac; Upper Grande Ronde - 500 ac; Crooked River National Grasslands 300 ac; Aldrich Mts 500 ac] |
| In cooperation with interested landowners and agencies, initiate riparian shrubland restoration on private and public land and secure conservation status for riparian shrublands. | Riparian shrubland habitat throughout ecoregion | Eastside All-Bird Implementation Plan (Ivey 2000) [recommended targets: Wallowa Plateau and County 1,000 ac; Upper Grande Ronde 500 ac; Burnt River 500 ac; Malheur Headwaters 200 ac; Aldrich Mts 300 ac] |
| Improve fish passage. For example, modify barriers or use full spanning structures where appropriate. | Lake Creek and Link Creek Fish Passage Improvement Project; and, all locations (as appropriate) | NWPCC Subbasin Plans, 2004; Oregon Biodiversity Project; Oregon Plan |
| Focus conservation attention on areas that meet American Fisheries Society requirements for being ecologically outstanding | South Fork John Day River and Joseph-Imnaha Plateau. | Oregon Biodiversity Project, Oregon Plan |
| Focus conservation attention on biologically unique habitats | Malheur headwaters; Bear Valley; Umatilla-Walla Walla headwaters | Oregon Biodiversity Project, Oregon Plan |
| Modify practices in forests, agriculture and urban areas to meet large wood levels, reduce sediment, extend fish passage | Trout Creek; Squaw Creek; Middle and Upper Deschutes; Crooked River; And, all locations (as appropriate) | NWPCC Subbasin Plans, 2004; Oregon Plan |
| Establish integrated framework for wetland restoration assessment, priority setting, and actions at three scales: watersheds, ecoregions and project sites | Wetlands | Recommendations for a nonregulatory wetland restoration program for Oregon. J.W. Good and C.B. Sawyer. 1998. Prepared for Oregon Division of State Lands and U.S. EPA Region X. |

*(continued on next page)*

| Actions | Strategy Habitat and General Location | Source Document |
|---|---|---|
| Increase incentives for proactive, nonregulatory wetland restoration and enhancement on private land, focusing on a combination of financial assistance, tax benefits, technical assistance, and education | Wetlands | Recommendations for a nonregulatory wetland restoration program for Oregon. J.W. Good and C.B. Sawyer. 1998. Prepared for Oregon Division of State Lands and U.S. EPA Region X. |
| Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology.<br>- Plant vegetation to stabilize banks; leaving stumps, fallen trees and boulders in waterways<br>- Maintain or enhance off channel or side channel meanders, habitat and pools | Aquatic habitats (streams, pools) | Oregon Aquatic habitat restoration and enhancement guide. The Oregon Plan for Salmon and Watersheds May 1999. See guide for specific technical recommendations, sources of information and assistance, and other guidelines. |
| Maintain riparian and wetlands function:<br>- Manage grazing, riparian vegetation planting and fencing, and livestock water facilities according to best practices, current techniques and with respect to natural hydrological conditions. | Riparian and wetlands habitats | Oregon Aquatic habitat restoration and enhancement guide. The Oregon Plan for Salmon and Watersheds May 1999. See guide for specific technical recommendations |
| Upslope erosion control:<br>- Create water and sediment control basins to contain runoff, wastewater<br>- Use windbreaks (tree and shrub rows using native plants) to reduce erosion and deposition<br>- Upland terracing | Aquatics, riparian and wetland habitats | Oregon Aquatic habitat restoration and enhancement guide. The Oregon Plan for Salmon and Watersheds May 1999. See guide for specific technical recommendations |

**Note: Strategy monitoring indicators, linked with OSOER Key indicators, targets, and methods, will be identified in a Statewide approach (See Monitoring Chapter for more information).*

**Approach:** Continue current efforts to provide water for wildlife in arid areas. Continue current design of big game "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.

**Factor: Invasive species.** Invasive plant 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 20 years. While not nearly as disruptive, invasive animals have caused problems for native wildlife species and have become a nuisance and impacted people economically.

**Approach:** Emphasize prevention, risk assessment, early detection and quick control to prevent new invasives from becoming fully established. Use multiple-site appropriate tools (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 Species occur. Cooperate with partners through habitat programs to reduce noxious weeds and other invasive species and to educate people about invasives issues. Promote the use of native "local" stock 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.

## *Conservation Success Stories*

### Pine Creek Conservation Area

When evening light paints golden highlights across rocky buttes and casts shadows into steep canyons, the Clarno Basin ranks among Oregon's most visually dramatic landscapes. A central part of this landscape is the 33,557-acre Pine Creek Conservation Area owned and managed by the Confederated Tribes of Warm Springs. These sagebrush steppes, grasslands, juniper woodlands, and riparian areas connect wildlife habitat across more than 10,000 acres of public lands, including the Spring Basin Wilderness Study Area and the Clarno Unit of the John Day Fossil Beds National Monument.

Western Juniper has encroached into sagebrush steppe and grasslands on the Conservation Area since the late 1800s. Juniper

encroachment eliminates habitat for sagebrush steppe and grassland-dependent wildlife. The Tribes are using prescribed fire and manual cutting to control juniper encroachment and restore open sagebrush steppe and grassland habitats. Native bunchgrasses collect and retain more water than juniper. Juniper management will benefit the watersheds of Pine Creek and the John Day River by improving groundwater recharge and increasing summer stream flow.

Photo © Mark Berry

The Conservation Area includes almost the entire watershed of Pine Creek, and six miles of John Day River front. Riparian areas on Pine Creek are recovering rapidly from past grazing practices, and removal of passage barriers has helped steelhead access the stream for spawning.

The Bonneville Power Administration (BPA) is funding acquisition and management of the Conservation Area as partial mitigation for wildlife habitat losses at the John Day Dam on the Columbia River. This project is one of three BPA-funded Conservation Areas owned and managed by the Tribes in the John Day Basin. More than 16 partners, including private individuals, non-profit organizations, and state and federal agencies, are assisting the Tribes with management and monitoring.

In addition to habitat restoration, the Tribes have implemented a successful public access program, creating new opportunities for tribal members and the public to hike, view wildlife, or hunt. The Conservation Area has potential to serve as a model for watershed recovery and wildlife habitat management in the lower John Day Basin.

**Longley Meadows Project: creek and meadow habitats restored while maintaining a viable cattle operation**

Alta Cunha and Moss Creek ranches, located west of LaGrande, recently worked together and with many partners to restore Longley Meadow and to improve habitat along a one-mile segment of the Grande Ronde River.

Ranch owners Carla Cunha, Shauna Mosgrove and Kelly Stinnett and numerous partners launched the project with planning in 1999 and construction from 2002 to 2004. The purpose of the project was to restore in-stream, streambank and wetland habitat along seven miles of three creeks and the main stem of the Grande Ronde River west of LaGrande. The project included building seven miles of fence to keep livestock away from the creeks and river, planting 40,000 shrubs and trees and developing nine off-channel water sources for livestock.

Partners used state-of-the-art stream restoration techniques to restore one mile of the Bear Creek channel to its historical configurations through Longley Meadow. The new, meandering channel doubled instream habitat and created slow water flow over gravely streambeds. Crews also placed whole trees with rootwads and woody debris into one mile of Jordan Creek.

To preserve the investment in the project, the ranch owners enrolled 445 acres of land adjacent to the creeks and river in the Conservation Reserve Enhancement Program and the Bonneville Power Administration's Fish Habitat Program. The agreements establish a 15-year streambank conservation easement.

Fourth generation ranch owner Mosgrove said that she, her mother Carla, and ranch co-owner Kelly started the project "with the traditional cattle operation perspective—help the stream, but keep the meadow for grazing." Project planners soon realized this wasn't possible. They toured similar projects. "I had grown up seeing streambank areas looking like putting greens and thought that was normal," she said. "I soon learned that restoration can bring huge benefits to a stream," she said.

Through numerous "stream summits" at the ranch with eight or nine project partners attending, the group found solutions that allowed stream restoration as well as grazing. Staff from the Natural Resources Conservation Service helped develop water sources other than the creeks and assisted with pasture rotation plans to offset the grazing lost from fencing off the ranch's best grazing in the meadow.

"A major surprise came when we found out that existing springs wouldn't be an adequate water source for the livestock," Mosgrove said. The solution: two wells, one of which is powered by a solar pump "that is working wonderfully," she added.

Five years after the start of planning, Mosgrove said it is satisfying to know that "you can do good things for the resource while keeping a viable cattle operation." Mosgrove said the highlight of the project occurred last spring when one of the Oregon Department of Fish and Wildlife biologists came to tell her that steelhead were building spawning nests in the restored creek bed.

Project partners included several local, state and federal agencies, including the Natural Resources Conservation Service, Oregon Department of Fish and Wildlife, Oregon Department of Transportation, Grande Ronde Model Watershed Program, Oregon Department of Forestry and the Confederated Tribes of the Umatilla Indian Reservation, which managed the project. "The partners worked throughout as a team, bringing technical knowledge, practical experience from similar projects and sources of funding," Mosgrove said. Individual landowners would not be able to tackle such projects without the good interagency cooperation shown from beginning to end, she noted.

The landowners were awarded the State Land Board's 2004 Stream Award for the Longley Meadows Project. The State Land Board Awards were created in 2003 to promote and recognize responsible, sustainable stewardship of natural resources.

## Deciding Where to Work

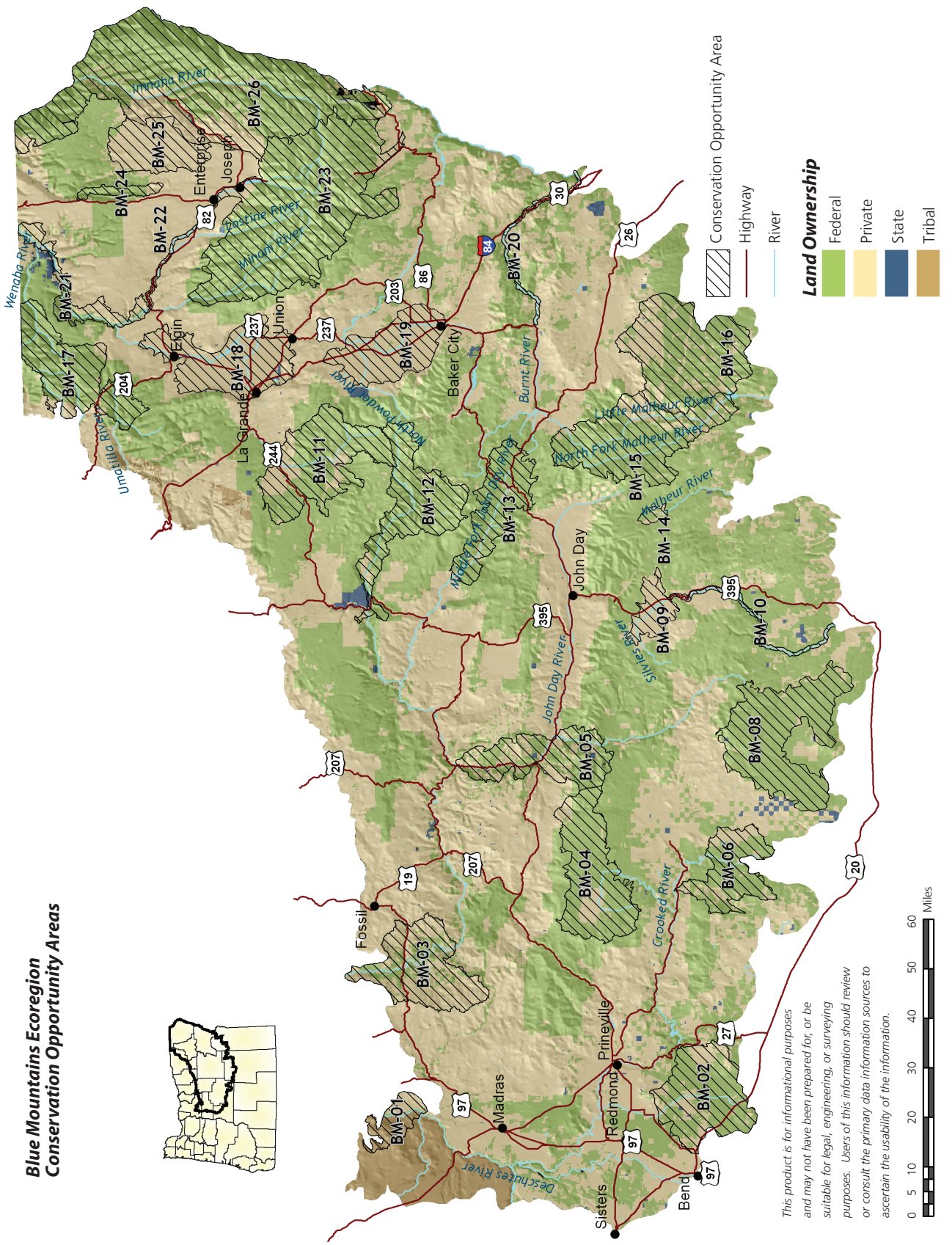
### *Conservation Opportunity Areas Map and Profiles*

Landowners and land managers throughout Oregon can contribute to conserving fish and wildlife by maintaining, restoring, and improving habitats. Conservation actions to benefit Strategy Species and Habitats are important regardless of location. However, focusing investments in certain priority areas can increase likelihood of long-term success over larger landscapes, improve funding efficiency, and promote cooperative efforts across ownership boundaries. Conservation Opportunity Areas are landscapes where broad fish and wildlife conservation goals would be best met. Conservation Opportunity Areas were developed to guide voluntary, non-regulatory actions. This map and the associated data should only be used in ways consistent with these intentions. For more information on how Conservation Opportunity Areas were developed, see Appendix IV, "Methods" (beginning on page a:34).

The Conservation Opportunity Area profiles include information on recommended conservation actions, special features, key species, key habitats, and if the area has been identified as a priority by other planning efforts. These profiles highlight some priority actions to implement in individual Conservation Opportunity Areas, which can range from restoration projects to monitoring for invasive species. These recommendations were identified through existing plans, spatial analysis, and expert review. They are not meant to be exhaustive, so other actions also will be appropriate, as influenced by local site characteristics and management goals. Actions need to be compatible with local priorities, local comprehensive plans and land use ordinances, as well as other local, state, or federal laws. Actions on federal lands must undergo federal planning processes prior to implementation to ensure consistency with existing plans and management objectives for the area.

## Collaboration between management and research to achieve conservation in the Blue Mountains Ecoregion

Several collaborative initiatives between research and management have contributed greatly to conservation in the Blue Mountains Ecoregion, and many of these efforts are currently continuing. In the 1990s, the Interior Columbia Basin Ecosystem Management Project (ICBEMP) was an interagency collaboration to address Columbia Basin resource issues. The project resulted in several publications and detailed maps of the region. Several natural resource research and management projects are centered in La Grande, Oregon. For 10 years, the Pacific Northwest Research Station maintained the Blue Mountains Institute, to help promote research into fire, forest health and ecosystems in the ecoregion. The Interior Northwest Landscape Analysis System at the La Grande Forestry and Range Sciences Lab is developing spatial data for vegetation in Blue Mountains watersheds. The Sagebrush Landscape Project at the Pacific Northwest Research Station in La Grande is investigating assessment of the conservation status of multiple species in sagebrush ecosystems, and developing and testing methodologies to accomplish these goals. The USDA-Forest Service Starkey Experimental Forest located near La Grande provides a venue for some of the most comprehensive field research projects ever attempted, with more than 22,000 acres of habitat and associated herds of big game and cattle. This provides an opportunity to investigate and evaluate the response of deer and elk to land management and use. Finally, another notable collaborative effort, the Grande Ronde Watershed Initiative, is discussed in the freshwater aquatic habitats discussion of the Strategy Habitats Chapter.


Blue Mountains Ecoregion
Conservation Opportunity Areas
Conservation Opportunity Area
Highway
River
Land Ownership
Federal
Private
State
Tribal
BM-01
BM-02
BM-03
BM-04
BM-05
BM-06
BM-08
BM-09
BM-10
BM-11
BM-12
BM-13
BM-14
BM-15
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BM-25
BM-26
Fossil
Madras
Prineville
Redmond
Sisters
Bend
John Day
Baker City
La Grande
Union
Elgin
Enterprise
Joseph
Crooked River
Deschutes River
John Day River
Middle Fork John Day River
North Fork John Day River
North Powder River
Burnt River
Malheur River
North Fork Malheur River
Little Malheur River
Silvies River
Umatilla River
Wenaha River
Imnaha River
Lostine River
Wallowa River
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0 5 10 20 30 40 50 60
Miles

## *Conservation Opportunity Area Profiles*

### *BM-01. Deschutes River area*

Area is comprised of the Lower Deschutes River and surrounding sage habitat from the ecoregion border south to the confluence with the Warm Springs River.

**Special Features:**

- *Area includes a section of the Lower Deschutes Wild and Scenic River.*
- *Area extends the Deschutes River conservation opportunity area from the Columbia Plateau ecoregion.*

**Key Habitats:**

- Aquatic
- Oak Woodlands
- Sagebrush Steppe And Shrublands

**Key Species:**

- Ferruginous Hawk
- Lewis' Woodpecker
- Bull Trout (Columbia River Population)
- Summer Steelhead
- Pygmy Rabbit

### *BM-02. Badlands*

**Special Features:**

- This area represents the largest block of old-growth western juniper habitat in Oregon.
- The Badlands Wildlife Study Area, Badlands Area of Critical Environmental Concern, and Horse Ridge area, all managed by the Bureau of Land Management, are within this conservation opportunity area.

**Key Habitats:**

- Old-growth Western Juniper

**Key Species:**

- Ferruginous Hawk
- Juniper-associated Songbirds
- Mule Deer

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas

**Recommended Conservation Actions:**

- Manage public access and recreational uses to minimize impacts on ecological values
- Protect old-growth juniper

### *BM-03. Lower John Day River area*

Located on the northern edge of the ecoregion along the lower John Day River West of Fossil.

**Special Features:**

- *Area includes the John Day Wilderness Study Area, Spring Basin Wilderness Study Area, and the Warm Springs Tribe's Pine Creek Ranch Wildlife Area.*
- *Area extends the John Day River Conservation Opportunity Area in the Columbia Plateau ecoregion.*
- *Ongoing restoration efforts by the Warm Springs Tribe.*
- *Spawning and rearing habitat for native steelhead populations*
- *Important wintering habitat for deer and elk*

**Key Habitats:**

- Grasslands
- Riparian
- Sagebrush Steppe And Shrublands

**Key Species:**

- Ferruginous Hawk
- Summer Steelhead
- Pygmy Rabbit

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan (John Day River)
- Oregon Biodiversity Project Conservation Opportunity Areas (Clarno area)

**Recommended Conservation Actions:**

- Maintain and/or initiate shrub-steppe restoration and management
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Restore and maintain complex, continuous sage habitat
- Restore and maintain grassland habitat

### *BM-04. Ochoco Mountains area*

**Special Features:**

- *Area includes part of the section of the North Fork Crooked*

*River designated as a Wild and Scenic River*

- *Scenic River Big Summit Prairie is one of the largest montane wetlands in eastern Oregon.*
- *Streams throughout this area provide habitat for inland Columbia Basin redband trout*
- *High potential for increase in breeding sandhill cranes*

**Key Habitats:**

- Aquatic
- Ponderosa Pine Woodlands
- Wetlands And Wet Meadows

**Key Species:**

- Sandhill Crane
- Columbia Basin Redband Trout

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Eastern Oregon Bird Conservation Plan (part of North Fork Crooked area)
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)

**Recommended Conservation Actions:**

- Restore wetland and riparian habitats at Big Summit Prairie
- Use fire and thinning to restore and enhance ponderosa pine forests

### ***BM-05. Picture Gorge-John Day River***

This area includes the mainstem John Day River from its intersection with the North Fork to the intersection with the South Fork, and extends down the South Fork John Day River to encompass the Black Canyon Wilderness. The area also includes the upland sage and shrubland habitat.

**Special Features:**

- *Area includes the Black Canyon Wilderness, Aldrich Mountain Wilderness Study Area, and John Day Fossil Beds National Monument.*
- *This area provides an important migratory corridor for migrating salmonids.*

**Key Habitats:**

- Aquatic
- Riparian
- Sagebrush Steppe And Shrublands

**Key Species:**

- Ferruginous Hawk
- Summer Steelhead
- Pygmy Rabbit

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Eastern Oregon Bird Conservation Plan (Aldrich Mountains)
- Oregon Biodiversity Project Conservation Opportunity Areas

**Recommended Conservation Actions:**

- Maintain and/or initiate shrub-steppe restoration and management
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Restore and maintain complex, continuous sage habitat

### ***BM-06. South Fork Crooked River area***

This area, located on the southern edge of the ecoregion primarily in the Prineville District of the BLM, is bisected by the Crooked River.

**Special Features:**

- *This area includes several areas managed for conservation values including the South Fork, Sand Hollow, and Gerry Mountain Wildlife Study Areas, as well as the South Fork Crooked River Area of Critical Environmental Concern.*

**Key Habitats:**

- Sagebrush Steppe And Shrublands
- Key Species:
- Sage Grouse
- Pygmy Rabbit

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan (section east of Crooked River)

**Recommended Conservation Actions:**

- Increase levels of large in-stream wood, reduce sediment, and improve fish passage
- Maintain and/or initiate shrub-steppe restoration and management
- Restore and maintain complex, continuous sage habitat

### ***BM-08. Silver Creek-Emigrant Creek***

This area is comprised of the Continental Zone Highlands subregion located west of the Silvies River along the southern edge of the ecoregion.

**Special Features:**

- *Area contains approximately 16% of the ecoregion's ponderosa pine habitat*

**Key Habitats:**

- Aquatic
- Ponderosa Pine Woodlands
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Columbia Spotted Frog
- Flammulated Owl
- Malheur Mottled Sculpin
- Oregon Great Basin Redband Trout

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Eastern Oregon Bird Conservation Plan (Emigrant Creek - Silver Creek area)
- The Nature Conservancy Ecoregional Assessment (Silver Creek, Emigrant Creek areas)

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Restore and maintain riparian habitats
- Use fire and thinning to restore and enhance ponderosa pine forests

### ***BM-09. Bear Valley***

Located south of John Day, along the Silvies River. The area encompasses the wetlands and riparian habitat in the valley.

**Special Features:**

- *Ecosystem management is already being employed here by some private land owners [Oregon Biodiversity Project website].*
- *Large wetland complex is keystone of Silvies River headwaters system, with major influence on downstream flows and water quality.*
- *This area provides significant percentage of the ecoregion's habitat for the upland sandpiper and bobolink.*
- Area contains 26% of the ecoregion's wetlands and wet meadows habitat and a large percentage of its riparian habitat
- There were 23 recorded nesting pairs of sandhill cranes here in 1999-2000.

**Key Habitats:**

Riparian

Wetlands And Wet Meadows

**Key Species:**

- Columbia Spotted Frog
- Bobolink
- Sandhill Crane
- Upland Sandpiper
- Inland Columbia Basin Redband Trout
- Malheur Mottled Sculpin
- Oregon Great Basin Redband Trout

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife

### ***BM-10. Silvies River***

The Silvies River from the ecoregion border to Bear Valley.

**Special Features:**

- *Extensive opportunities exist in this area for redband trout recovery, primarily related to fish passage and screening. These projects would provide a comprehensive migratory component for redband trout populations.*
- *Area has extensive wet meadows and important riparian habitats.*

**Key Habitats:**

- Aquatic
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Oregon Great Basin Redband Trout

**Recommended Conservation Actions:**

- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife

### ***BM-11. Upper Grande Ronde area***

**Special Features:**

- *Contains the section of the Upper Grande Ronde River designated with a Wild and Scenic River designation.*
- *Wetlands Reserve Program project on McCoy Creek is restoring wetlands and natural stream channel on 500 acres; partners include Umatilla tribes, Bonneville Power Administration; USFWS; EPA.*
- *Vey Meadows area has long been considered one of basin's most important salmonid habitats, often referred to as a "natural hatchery", area has high potential for habitat restoration and enhancement.*

**Key Habitats:**

- Aquatic
- Grasslands
- Ponderosa Pine Woodlands
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Flammulated Owl
- Bull Trout (Columbia River Population)
- Spring Chinook Salmon
- Summer Steelhead
- American Marten

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Maintain and restore wet meadows
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife

### ***BM-12. North Fork John Day River***

**Special Features:**

- This area encompasses most of the North Fork John Day Wilderness as well as the Vinegar Hill pending Research Natural Area (prna).
- The North Fork John Day River supports the largest and most important run of anadromous fish within this Basin. [Wallowa-Whitman National Forest website]
- The river provides a major migratory corridor for Rocky Mountain elk and mule deer.
- This area includes the section of the North Fork John Day designated as a Wild and Scenic River.

**Key Habitats:**

- Aquatic

**Key Species:**

- Flammulated Owl
- Bull Trout (Columbia River Population)
- Summer Steelhead
- Westslope Cutthroat Trout
- American Marten

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife

### ***BM-13. Middle Fork John Day River***

**Special Features:**

- *Area includes the Nature Conservancy's Dunstan Homestead Preserve on the Middle Fork John Day River*
- *There has been work here by partners (The Nature Conservancy ODFW, Malheur National Forest, the Umatilla and Warm Springs Confederated Tribes, BPA, Oregon Water Trust, Grant Soil and Water Conservation District) on streamflow restoration and floodplain enhancement.*
- *Area contains strong populations of all three genera of freshwater mussels native to the Pacific Northwest.*

**Key Habitats:**

- Aquatic
- Aspen

- Ponderosa Pine Woodlands
- Riparian
- Sagebrush Steppe And Shrublands
- Wetlands And Wet Meadows

**Key Species:**

- Columbia Spotted Frog
- Flammulated Owl
- Upland Sandpiper
- White-headed Woodpecker
- Bull Trout (Columbia River Population)
- Pacific Lamprey
- Spring Chinook Salmon
- Summer Steelhead
- American Marten
- Freshwater Mussels

**Identified in other planning efforts:**

- NMFS (National Marine Fisheries Service). 2000. Federal Columbia River Power System Biological Opinion. December 21, 2000
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife, including increasing channel length and sinuosity, and decreasing channel gradient
- Restore and maintain ponderosa pine habitats, and upland quaking aspen clones, including appropriate fire management
- Restore river and floodplain interactions

### ***BM-14. Logan Valley***

Located south of the Strawberry Mountains, southeast of John Day, OR.

**Special Features:**

- *Much of this area is currently being managed for wildlife diversity by conservation partners including the Burns Paiute Tribe, The Nature Conservancy, and Malheur National Forest.*
- *Ongoing conservation work here includes maintenance of the wet meadows for nesting birds and riparian restoration to enhance bull trout habitat.*
- *This area is one of four known nesting sites in Oregon for the upland sandpiper. It is also a known nesting site for the long-billed curlew.*

**Key Habitats:**

- Aquatic
- Riparian
- Sagebrush Steppe And Shrublands
- Wetlands And Wet Meadows

**Key Species:**

- Long-billed Curlew
- Upland Sandpiper
- Bull Trout (Columbia River Population)

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Restore and maintain complex, continuous sage habitat
- Restore and maintain riparian habitats

### ***BM-15. North Fork Malheur-Monument Rock area***

This area includes much of the North Fork of the Malheur River as well as the Little Malheur River.

**Special Features:**

- *Area encompasses the Monument Rock Wilderness and the section of the North Fork Malheur designated as a Wild and Scenic River.*
- *This is an ecologically complex and diverse area including 5 different sub-ecoregions ranging from the Continental Zone Foothills up through the Subalpine Zone.*

**Key Habitats:**

- Aspen
- Ponderosa Pine Woodlands
- Riparian
- Sagebrush Steppe And Shrublands
- Wetlands And Wet Meadows

**Key Species:**

- Flammulated Owl
- Lewis' Woodpecker
- Bull Trout (Columbia River Population)
- Inland Columbia Basin Redband Trout
- American Marten
- Pygmy Rabbit

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan (Malheur Headwaters area)
- Oregon Biodiversity Project Conservation Opportunity Areas (Malheur Headwaters area)
- The Nature Conservancy Ecoregional Assessment (Monument Rock area)

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Maintain and enhance aspen stands
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Restore and maintain complex, continuous sage habitat
- Restore and maintain grassland habitat
- Restore and maintain ponderosa pine habitats

### ***BM-16. Bully Creek area***

Located adjacent to the North Fork Malheur-Monument Rock area, this Conservation Opportunity area is focused on the sagebrush habitat.

**Special Features:**

- *Area includes the Beaver Dam Creek Wilderness Study Area, as well as the Castle Rock and Bully Creek Areas of Critical Environmental Concern.*
- *Area supports significant sage grouse populations.*
- *Area contains 7% of the ecoregion's sage steppe and shrubland habitat*

**Key Habitats:**

- Aspen
- Ponderosa Pine Woodlands
- Sagebrush Steppe And Shrublands

**Key Species:**

- Ferruginous Hawk
- Sage Grouse
- Pygmy Rabbit

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)
- Oregon Biodiversity Project Conservation Opportunity Areas

**Recommended Conservation Actions:**

- Maintain and enhance aspen stands
- Restore and maintain complex, continuous sage habitat. Maintain and restore sagebrush-steppe habitats

### ***BM-17. Umatilla-Walla Walla area***

This area includes the headwaters of the Umatilla and Walla Walla River, and extends north to the ecoregion border.

**Special Features:**

- *Area encompasses the North Fork Umatilla Wilderness and the Wenaha-Tucannon Wilderness.*
- *Area provides spawning habitat for Chinook salmon and steelhead*

**Key Habitats:**

- Aquatic
- Grasslands
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Lewis' Woodpecker
- Bull Trout (Columbia River Population)
- Margined Sculpin
- Spring Chinook Salmon
- Summer Steelhead
- American Marten

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity and plant endemism area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology

- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Promote early detection and suppression of invasive weeds

### ***BM-18. Grande Ronde Valley***

The Grande Ronde River Basin between Elgin and Union.

**Special Features:**

- *There are ongoing efforts by Joint Venture partners (ODFW, The Nature Conservancy, Natural Resources Conservation Service, and Ducks Unlimited) to restore up to 1000 acres of wetland habitat here. Several Wetlands Reserve Program projects are restoring wetlands on private lands.*
- *Conley Lake, included in this area, provides important habitat for migrating white-fronted geese and other waterfowl.*
- *Area contains a large percentage of the ecoregion's bobolink habitat.*
- *Breeding area for sandhill cranes.*
- *Important habitat for migratory waterfowl and shorebirds.*

**Key Habitats:**

- Aquatic
- Grasslands
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Bobolink
- Sandhill Crane
- Shorebirds
- Upland Sandpiper
- Waterfowl
- Bull Trout (Columbia River Population)
- Spring Chinook Salmon
- Summer Steelhead

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Manage Ladd Marsh Wildlife Area's wetlands to optimize habitat values for diversity of breeding and migrating birds
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Restore seasonal wetlands and semi-permanent marshes

### ***BM-19. Baker Valley***

The Powder River Basin north of Baker City.

**Special Features:**

- *Area contains 12% of the ecoregion's wetlands*
- *High restoration potential for aquatic and riparian systems.*
- *Adjacent area east of this site has high conservation potential for sage grouse.*
- *Wetland Reserve Program project on Baldock Slough has restored more than 700 acres of wetlands and grasslands with high value for migratory birds.*
- *Baker SWCD is undertaking ambitious program to provide off-stream water for livestock and restore riparian habitats.*
- *US Fish and Wildlife Service holds conservation easement on property at North Powder that includes floodplain wetlands and ESA listed plants.*

**Key Habitats:**

- Aquatic
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Bobolink
- Upland Sandpiper
- Howell's Thelypody
- Oregon Semaphore Grass

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Protect, restore or enhance habitat for ESA-listed plants (Howell's thelopody, Oregon semaphore grass)
- Restore seasonal wetlands

### ***BM-20. Burnt River***

The Burnt River from the ecoregion border to where it parallels Highway 245.

**Special Features:**

- *This area provides good opportunities for riparian restoration.*

**Key Habitats:**

- Aquatic
- Riparian
- Sagebrush Steppe And Shrublands

**Key Species:**

- Riparian Birds
- Sage Grouse

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan (Burnt River area from Hwy 245 to Interstate 84)
- The Nature Conservancy Ecoregional Assessment (small area between Hwy 245 and Interstate 84)

**Recommended Conservation Actions:**

- Maintain and enhance sagebrush habitats
- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife

### ***BM-21. Lower Grande Ronde***

Area follows the Grande Ronde River from the Oregon border to its intersection with the Wallowa River, then up the Wallowa to Highway 82.

**Special Features:**

- *Area encompasses both the Grande Ronde and the Wallowa Wildlife Study Areas.*
- *Grande Ronde Model Watershed program is working with private landowners to restore floodplain wetlands in several areas to improve irrigation return water quality and habitat for fish and wildlife.*

**Key Habitats:**

- Aquatic
- Grasslands
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Bobolink
- Bull Trout (Columbia River Population)
- Fall Chinook Salmon
- Spring Chinook Salmon
- Summer Steelhead

**Identified in other planning efforts:**

- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Reestablish floodplain forests
- Restore floodplain wetlands

### ***BM-22. Wallowa River***

**Special Features:**

- *There is a project lead by Wallowa Resources to provide high quality off-channel rearing habitat for juvenile spring chinook and summer steelhead in the Wallowa River.*

**Key Habitats:**

- Aquatic
- Riparian

**Key Species:**

- Riparian Birds
- Bull Trout (Columbia River Population)
- Spring Chinook Salmon
- Summer Steelhead

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan (Wallowa Plateau and Canyons area)
- The Nature Conservancy Ecoregional Assessment

### ***BM-23. Eagle Cap-Wallowa Mountains***

Located in northeastern Oregon on the Wallowa -Whitman National Forest.

**Special Features:**

- *Area contains the Eagle Cap Wilderness, several Wild and Scenic Rivers, and a number of research natural areas.*
- *This area has diverse plant communities ranging from low elevation grasslands to alpine meadows.*
- *The Eagle Cap Wilderness has a Prescribed Natural Fire Plan implemented by the Wallowa-Whitman National Forest.*

- *Managers monitor several factors in the Eagle Cap Wilderness including water quality and range condition to assess the impacts of recreation.*
- *Summer range habitat for white-tailed deer, mule deer, and Rocky Mountain elk*

**Key Habitats:**

- Aquatic
- Ponderosa Pine Woodlands
- Wetlands And Wet Meadows

**Key Species:**

- Columbia Spotted Frog
- Ferruginous Hawk
- Flammulated Owl
- Lewis' Woodpecker
- Bull Trout (Columbia River Population)
- Spring Chinook Salmon
- Summer Steelhead
- American Marten
- Bighorn Sheep
- Mountain Goat

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity and plant endemism area)
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Manage recreational uses to minimize impacts on sensitive habitats

### ***BM-24. Swamp Creek***

Area is located north of Enterprise, OR on Forest Service land paralleling Hwy 3.

**Special Features:**

- *Area includes the area of Swamp Creek designated as a Wild and Scenic River.*

**Key Habitats:**

- Aquatic
- Ponderosa Pine Woodlands
- Riparian
- Wetlands And Wet Meadows

**Key Species:**

- Summer Steelhead

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Eastern Oregon Bird Conservation Plan

**Recommended Conservation Actions:**

- Initiate or continue wet meadow conservation and restoration efforts
- Restore or enhance riparian habitats and floodplain forests

### ***BM-25. Zumwalt Prairie Plateau***

Located on the eastern edge of the ecoregion northeast of Enterprise and Joseph, the area encompasses the grasslands on the plateau.

**Special Features:**

- *One of the largest blocks of native grassland in North America.*
- *Area builds off of the The Nature Conservancy's Zumwalt Prairie Preserve.*
- *One of the highest known concentrations of breeding hawks and eagles in North America [The Nature Conservancy website].*
- *The Nature Conservancy is conducting ongoing research and restoration in the Zumwalt Prairie Preserve.*
- *48 species of butterflies have been observed here.*

**Key Habitats:**

- Grasslands
- Riparian

**Key Species:**

- Ferruginous Hawk
- Grassland Birds
- Swainson's Hawk
- Small Mammals
- Indian Ricegrass
- Spalding's Companion

**Identified in other planning efforts:**

- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas
- The Nature Conservancy Ecoregional Assessment

### ***BM-26. Hells Canyon***

Area follows the Canyons and Dissected Uplands/Highlands subregions along the Snake River from Hwy 86 north to the ecoregion boundary.

**Special Features:**

- *Area includes the Hells Canyon Wilderness, Imnaha River Wild and Scenic River area, McGraw Creek Wilderness, part of Zumwalt Prairie, and several Areas of Critical Environmental Concern.*
- *Area contains 10% of the ecoregion's grasslands.*

**Key Habitats:**

- Grasslands
- Ponderosa Pine Woodlands
- Riparian

**Key Species:**

- Columbia Spotted Frog
- Ferruginous Hawk
- Flammulated Owl
- Lewis' Woodpecker
- Bull Trout (Columbia River Population)
- Fall Chinook Salmon
- Inland Columbia Basin Redband Trout
- Spring Chinook Salmon
- Summer Steelhead
- American Marten
- Bighorn Sheep
- Mountain Goat

**Identified in other planning efforts:**

- American Fisheries Society Aquatic Diversity Areas
- Eastern Oregon Bird Conservation Plan (Wallowa Plateau and Canyons)
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)
- Oregon Biodiversity Project Conservation Opportunity Areas (Wallowa Plateau and Canyons, Joseph Imnaha Plateau)
- The Nature Conservancy Ecoregional Assessment

**Recommended Conservation Actions:**

- Maintain and enhance aspen stands
- Maintain and restore riparian habitats
- Promote early detection and suppression of invasive weeds
- Protect and enhance vernal pool wetlands (i.e., Clear Lake, Downy Lake)
- Use fire and thinning to restore and enhance ponderosa pine forests

## Invasive weed control in the Blue Mountains Ecoregion requires collaboration among many partners

Invasive weeds are an enormous economic threat to working landscapes, costing millions of dollars of damage each year in Oregon. The threat of weed extends across land ownership boundaries, making collaboration among multiple partners essential. In the Blue Mountains ecoregion, several large-scale collaborative projects are underway to address weed management concerns. The Baker County Weed Board is exploring innovative ways to control the spread of invasive weeds through the creation of a weed cost share program. The program offers reimbursement of up to 50 percent for county residents who apply herbicides or contract out work to eliminate invasive weeds on private land. County agents are currently focusing their efforts on controlling the spread of leafy spurge in the 200,000 acre Alder Creek area. Leafy spurge damages native plant communities by out-competing and displacing native plants, and can result in loss of livestock forage. Additionally, if consumed, leafy spurge causes irritation to the mouth and digestive tract of cattle, which can result in death. Funding for the program comes from a county weed levy and the state weed board. The cost share program is a great example of invasive weeds being addressed in a cooperative manner and is considered a success with more than 80 percent involvement by the public.

Another cost-sharing program that began in 2003 is a partnership between the Bureau of Land Management (BLM)'s Idaho and Oregon/Washington offices and The Nature Conservancy (TNC). The objective of this program is to accelerate weed management through Cooperative Weed Management Areas (CWMAs) and county weed programs. CWMAs appear to be useful tools in achieving a collaborative approach toward managing weeds. A protocol (Guidelines for Cooperative Management of Noxious Weeds:  Development of Weed Management Areas) has been very successful in helping direct implementation. Essential components of the management process include program coordination, marketing support for public education, and information management. The next step is to identify long-term goals and estimates of resources required to continue managing the CWMAs. BLM and TNC are now working on several projects to address these and other needs, including work with the Idaho Department of Agriculture on a database for tracking and sharing weed management information, shared training, and public education. For more information about this project, contact Alan Holt at The Nature Conservancy (aholt@tnc.org). Participants in the project also include: Washington State Noxious Weed Control Board; Cooperative Weed Management Areas in the Tri-State (Hell's Canyon), Tri-County (eastern Oregon), and Warner Basin (eastern Oregon).