



the OREGON CONSERVATION STRATEGY



Chapter 8: Conservation Toolbox



2016



Oregon Department
of Fish and Wildlife



OregonConservationStrategy.org

Table of Contents – Chapter 8: Conservation Toolbox

CONSERVATION TOOLBOX.....	1
OUTREACH, EDUCATION, AND ENGAGEMENT.....	2
VOLUNTARY CONSERVATION PROGRAMS.....	16
CONSERVATION IN URBAN AREAS	25
PLANNING AND REGULATORY FRAMEWORK	32
GENERAL REFERENCES	54

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

For more information on the Oregon Conservation Strategy or to provide comments, email Conservation.Strategy@state.or.us or write to Oregon Department of Fish and Wildlife, 4034 Fairview Industrial Drive SE, Salem, OR 97302.

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: Willamette daisy, ODA



Photo Credit: USFWS

CONSERVATION TOOLBOX

Everyone has a role in the successful implementation of the Oregon Conservation Strategy. The Conservation Toolbox provides recommendations to support implementation and suggestions for additional information and assistance.

Key components of the Conservation Toolbox include:

- [Outreach, Education, and Engagement](#)
- [Conservation in Urban Areas](#)
- [Oregon's Existing Planning and Regulatory Framework](#)
- [Voluntary Conservation Programs](#)
- [General References](#): additional resources outside of the references provided in each section

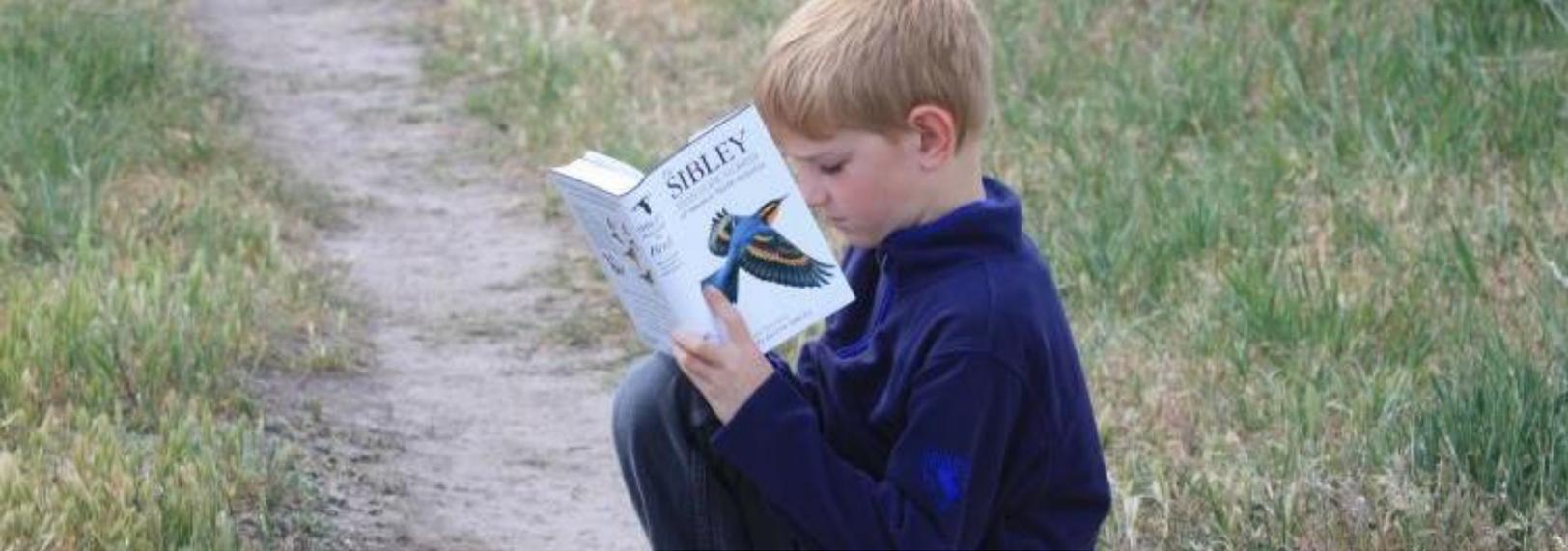


Photo Credit: Kathy Munsel, ODFW

OUTREACH, EDUCATION, AND ENGAGEMENT

Connecting people to nature is an important element of successful Conservation Strategy implementation. Acquiring the knowledge, skills, and motives to conserve Oregon's native fish and wildlife empowers people to work together to take strategic actions for the benefit of current and future generations. Fostering broad participation in conservation will be critical to maintain Oregon's fish, wildlife, and habitats.

Ways to engage Oregonians in conservation include:

- **Strategy Outreach** – tell people about the Strategy's goals, voluntary approach, and opportunities.
- **Conservation Education** – provide opportunities for people to learn about their natural environment.
- **Fish and Wildlife-based Tourism** – maintain existing and expand sustainable fish and wildlife-based recreation to increase support for fish and wildlife conservation, and to support local economies. Support hunting, fishing, and wildlife viewing.
- **Human Dimensions Research** – learn more about Oregonians' attitudes toward conservation, how to foster more public involvement in conservation, and how to best support and incentivize landowners in voluntary conservation.

OREGON CONSERVATION STRATEGY OUTREACH AND EDUCATION

According to the [North American Association of Environmental Education](#), conservation education should foster clear awareness of conservation issues and provide opportunities to acquire knowledge and skill. The results can deepen commitment and create new patterns of behavior. Many current education programs focus on building awareness, but knowledge and awareness of issues are just the first two steps. Conservation education programs need to serve all age levels and include tangible action

items to model behavior. Ideally, conservation education will provide Oregonians with an understanding of the various issues involved with species conservation and natural resource management so they can understand all sides of complex issues and support sound decisions.

Education and outreach will be most effective when linked strategically to other actions, such as land management and habitat conservation, water management, or incentives for private landowners. Successful implementation of this Strategy depends on expanded involvement from a wide variety of people, agencies, and groups across the state. Effective outreach will be needed to share the goals, voluntary approaches, recommended actions, and benefits of habitat conservation to diverse Oregonians and partners. Equally important tasks are listening to input from diverse sources and providing opportunities for meaningful involvement and decision-making. Some important audiences are:

General Public Outreach and Education

Help individuals understand statewide habitat conservation goals in both urban and rural areas, with a focus on locally occurring ecoregions, habitats, and species. Build connections between the diverse communities of Oregon to help support a statewide commitment to conservation of Oregon's fish, wildlife, and habitats.

Private Landowners

Both urban and rural landowners should get recognition for the contributions they are already making to species conservation. Farms, ranches, and forests provide a variety of fish and wildlife habitats, and many rural landowners are actively improving habitat through improved management practices or specific projects. Provide information about these contributions and the connections that all Oregonians have to agricultural and forest landowners who grow the food they eat and the other products they use. Introduce urban Oregonians to diverse products from rural landowners who use certification or marketing programs that support sustainable or habitat-friendly activities. Similarly, recognize positive efforts to address conservation issues and provide habitat within urban areas, such as sustainable building, invasive species control, "[Naturescaping](#)" in backyards, and maintaining natural park networks that support fish and wildlife habitat and improve the quality of life for people.

Oregon Conservation Strategy Key Conservation Issue: [Challenges and Opportunities for Private Landowners to Initiate Conservation Actions](#)

Young Oregonians

The future lies with Oregon's younger citizens, in both K-12 and higher education (colleges and universities). Young people, both in rural and urban areas, need to see good examples of real people integrating ecological and economic values on farms and in forests, and diverse and innovative partnerships for habitat conservation. The more exposure young Oregonians have to real people doing habitat conservation, the more likely they are to support these activities in adulthood. Programs for

young people need to include opportunities to participate in habitat conservation projects, whenever possible. Opportunities include working with youth groups, local governments, schools, and service learning programs. These expose students to different learning opportunities, help them develop a sense of commitment to their community and local habitats, and may introduce them to possible careers in the field.

There are opportunities to work with educators to provide additional opportunities for teacher training on conservation education curriculum and instructional strategies at no cost to teachers or schools. Classroom-based conservation education programs can be integrated with state academic standards and linked with standards for reading, math, and other subjects beyond science.

Research conducted by undergraduate and graduate students can be an important way to address information and monitoring needs for the Conservation Strategy. Colleges and universities are important partners for providing educational, technical, monitoring, and research assistance to landowners, Oregonians, agencies, and policy-makers.

Federal and State Agencies and Other Conservation Partners

Provide information about the Conservation Strategy and opportunities for coordination. Help diverse agencies and staff understand statewide and ecoregional habitat conservation goals and incorporate them into programs, policies, and priorities whenever possible. In addition to agencies, there are potential roles for landowners, land managers, nonprofit organizations, universities and schools, business owners, local governments, elected officials, planners, consultants, and civic groups. Outreach efforts need to target all potential conservation partners.

The Conservation Strategy will build on existing efforts to conduct outreach and conservation education, expanding reach through partnerships. The following provides some examples of ongoing efforts by many agencies, schools, and organizations in Oregon:

- Interpretation presentations and educational programs, such as campground talks, nature walks, skills workshops, hunter and angler education programs, games, and other children's programs and exhibits
- Informational signage, brochures, videos, and other materials at agency offices, trails, campsites, wildlife refuges, and other outdoor recreation sites
- School-sponsored learning, including outdoor camps, internships, restoration projects at schools, and classwork such as [Bird by Bird](#)
- Special events, such as festivals and camps (e.g., [Oregon Zoo](#), [Oregon Museum of Science and Industry](#))
- Fish and wildlife viewing programs, such as whale watching, bird watching, and elk viewing

- Information on reducing human/wildlife conflicts in urban areas, such as Oregon Department of Fish and Wildlife's (ODFW) [Living with Wildlife](#), and the [Audubon Society of Portland](#)
- Media relationships, such as Oregon Public Broadcasting's [Oregon Field Guide](#)
- Booths at county fairs and other community events
- [Volunteer programs](#)
- Newsletters, such as the Oregon Conservation Strategy [e-newsletter](#)
- [Citizen science](#)

Goal 1: Improve Coordination, Strategic Implementation, and Evaluation of Conservation Education in Oregon

Action 1.1. Build on existing efforts

- Inventory conservation/environmental education activities currently underway to determine which could help to promote the Conservation Strategy.
- Work with local, state, and federal parks, wildlife areas, campsites, and other recreational programs to enhance interpretation programs.
- Enhance effective partnerships with organizations whose primary mission is conservation education (e.g., non-governmental organizations, universities, agencies). Seek new conservation education partners in Oregon.
- Fold Conservation Strategy priorities into the education and outreach activities of federal, state, and local natural resource agencies, non-governmental organizations, and other education providers.
- Support environmental education programs for educators and students K-12.

Action 1.2. Marketing and promotion

- Develop education materials about the Conservation Strategy. Produce outreach materials addressing [Strategy Species](#) and [Habitats, Conservation Opportunity Areas](#), and conservation actions and issues. Inform people about opportunities to weave conservation goals into ongoing planning, greenspace acquisition and management, neighborhood projects, educational programs, restoration programs, and so on.
- Work with media partners to promote the Conservation Strategy and its implementation priorities and create messages which report successes achieved by the Conservation Strategy.
- Produce "virtual tours" of particular areas of the state to promote Strategy Species and Habitats and link to partner websites.

Action 1.3. Incorporate outreach and education into other voluntary actions

- Produce informational brochures for landowners on Strategy Species and Habitats (also see [Voluntary Conservation Programs](#)).
- Develop educational tools that complement on-the-ground conservation actions and management for Strategy Species and Habitats.
- Work with the Oregon Invasive Species Council to develop a statewide invasive species awareness campaign, which will assess Conservation Strategy needs for education and marketing. Develop other tools for public participation for preventing introductions of new invasive species to Oregon.

FISH AND WILDLIFE-BASED TOURISM

Overview

Because of the diversity and beauty of its landscape and richness in flora and fauna, Oregon is an outstanding state for outdoor experiences. Fish and wildlife-based tourism can promote conservation through public outreach and support, diversify local economies, and provide rewarding experiences for a variety of people. Oregon’s approach is to support efforts to create and promote sustainable fish and wildlife-based tourism opportunities. In this discussion, the term “wildlife tourism” refers to recreational activities based on both fish and wildlife use and appreciation.

Objectives

- Provide strategic direction and leadership on sustainable wildlife watching opportunities, hunting and fishing opportunities, and education in Oregon.
- Promote sustainable tourism and tourism-generated economic development appropriate to Oregon’s regional communities and consistent with the values and principles underlying the Conservation Strategy.
- Investigate potential sources of future income generation resulting from sustainable wildlife tourism development and growth that will benefit both local communities and the Conservation Strategy’s wider conservation goals.
- Integrate sustainable tourism opportunities, where appropriate, into regional and statewide programs developed as a result of the Conservation Strategy.
- Facilitate greater collaboration and cooperation over wildlife tourism opportunities in Oregon with interested regional and state tourism associations, Oregon’s destination management organizations, tourism industry operators, and key stakeholders identified through the Conservation Strategy development process.

- Continue to promote hunting- and fishing-based tourism. Oregon is known for its wide open spaces, rugged landscapes, and great hunting and fishing opportunities. Over 16 million acres of public land are open to recreational users, including hunting, fishing, hiking, biking, and camping. Hunting and fishing are an outdoor heritage for Oregonians, and sportsmen and women continue to support conservation efforts and recovery of both “game” and “nongame” fish and wildlife.

Challenges and Opportunities

- Enhance awareness of the workings and interests of the tourism industry and its relevant opportunity areas among the stakeholders, regional organizations, and fish and wildlife programs associated with the Strategy.
- Enhance awareness of sustainable wildlife-based tourism opportunities and relevant conservation needs, interests, and priorities within Oregon’s tourism industry, particularly its nature-based tourism sector.
- Align conservation programs and sustainable tourism development needs and opportunities of Oregon and its regions.

Tourism Trends

According to the Travel Industry Association of America, significant travel trends affecting Oregon’s tourism industry include:

- Oregon’s diverse regions, from the coast and mountains to valleys and deserts, offer a rich variety of outdoor activities for everyone, from the extreme sport participants to fishing enthusiasts to the family vacationer.
- Recreation and adventure interests and options range from the ‘soft’ (at the more relaxed, observational, and passive end) to the ‘hard’ (more active and physical with an element of potential ‘danger’).
- Outdoor recreation and/or visiting national or state parks is one of the top activities for U.S. travelers taking leisure trips within the U.S.
- One in five (21 percent) leisure person-trips includes some form of outdoor recreation and/or a visit to a national or state park.
- Half of all U.S. adults, or 98 million people, have taken an adventure trip in the past five years. This includes 31 million adults who engaged in hard adventure activities like whitewater rafting, scuba diving, and mountain biking.
- Camping is the number one outdoor vacation activity in America. One-third of U.S. adults say they have gone on a camping vacation in the past five years. The average age of travelers who go camping is 37, and their median household income is \$43,000.

- One-fifth of U.S. adults attended a festival while on a trip away from home in the past year. One-third of festival travelers attended an arts or music festival in the past year; twenty-two percent of festival travelers attended an ethnic, folk, or heritage festival. Festival attendance often involves camping.

Travel Oregon aims to enhance Oregonians’ quality of life by strengthening economic impacts of the state’s \$10.3 billion tourism industry and promotes fish and wildlife-based tourism opportunities.

Value of Fish and Wildlife-based Tourism and Recreation

National recreation surveys have provided useful information on popular activities in the U.S. These surveys provide valuable indicators of Americans’ outdoor recreation activities and their interest in enjoying these activities when visiting different places or destinations.

Wildlife viewing can complement camping, hunting, and fishing activities, and can be enjoyed year-round by virtually all ages. For example, in 2011:

- Nearly a third of the U.S. population participated in wildlife viewing activities.
- 1.2 million residents and nonresidents 16 years old or older participated in wildlife watching in Oregon.
- More than 800,000 Oregonians participated in bird watching.

In 2013, there were approximately 259,000 licensed hunters and 617,000 licensed anglers in Oregon. Approximately 243,000 hunters and 493,000 anglers were Oregon residents. Licensed resident hunters make up 8.3 percent of the state population aged 12-69. Licensed resident anglers make up 17.4 percent of the state population aged 14-69.

Results from the **2011 National Survey of Fishing, Hunting, and Wildlife-associated Recreation** by the U.S. Fish and Wildlife Service (USFWS) showed that Oregon derived \$2.7 billion in revenue from all wildlife-related recreational activities in 2011. Of that amount, Oregonians spent \$1.7 billion.

2011 Expenditure Data for Hunters, Anglers, and Wildlife Viewers Active in Oregon*

	Hunters	Anglers	Viewers
Food and Lodging	\$35.8 Million	\$148.7 Million	\$275 Million
Transportation	\$42.3 Million	\$95.8 Million	\$196.8 Million
Other Trip Costs*	\$16.9 Million	\$29.7 Million	\$9.9 Million

	Hunters	Anglers	Viewers
Equipment	\$61.5 Million	\$235.3 Million	\$253.2 Million
Other Expenditures**	\$16.9 Million	\$29.7 Million	\$196 Million
Approximate Total	\$173.6 Million	\$538.4 Million	\$930.9 Million

**2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*

***Includes expenditures for magazines, membership dues, contributions, stamps, and permits.*

A 2009 [study](#) commissioned by the ODFW and Travel Oregon provides a comprehensive effort to describe and quantify the economic impacts of hunting, fishing, wildlife viewing, and shellfish harvest participation and related expenditures made throughout Oregon.

Goal 2: Promote Tourism Opportunities related to the Oregon Conservation Strategy

Tourism opportunities promoted by the Conservation Strategy will be implemented in partnership with Travel Oregon. ODFW and partners will work with landowners and land managers, communities, and other partners in developing projects and be sensitive to any concerns local communities may have. All proposed actions must review and consider any potential impacts to both species and habitats.

Action 2.1. Explore joint tourism marketing and market research opportunities

Explore joint opportunities for cooperative marketing of key nature-based tourism themes (including wildlife watching). In addition, determine priority areas of joint need for undertaking cooperatively-funded market research that will better inform the marketing and product development strategies adopted.

Action 2.2. Determine regional priorities for tourism in relation to wildlife watching opportunities

In relation to any regional program development criteria involving wildlife tourism initiatives, investigate the merits of applying two or more levels of developmental and marketing status for Oregon's [ecoregions](#). Each level would be acknowledged to have different strategic and program support needs, which also might logically reflect different levels of investment. For example:

- Ready proximity to visitor markets (and major ports/cities/highways of entry)
- Product/experience readiness
- Product quality
- Extent of product's visitor and market appeal

- Extent of supporting amenities and services (including nearby accommodation options)
- Extent of other available experiences of complementary importance to visitors

Action 2.3. Build on existing wildlife-watching programs

Support and expand the many fish and wildlife-watching programs that currently exist. Work with Travel Oregon, Oregon Parks and Recreation Department, Audubon Society, federal agencies, and other partners to promote development and expansion of [birding trails](#) in Oregon. Work with the Oregon Parks and Recreation Department to support existing [whale watching programs](#). Work with local groups to promote existing wildlife festivals.

Action 2.4. Determine a cost-effective education and development approach to wildlife tourism in Oregon

Great benefits can result from adopting a tourism education and tourism development approach that draws on the success of others and the value of testing new ‘product’ ideas through pilot projects selected for their high likelihood of success and their likely educational value. For example, in relation to privately owned and operated wildlife- and nature-based tourism services/attractions, the successful case studies represented by Wanderlust Tours in Bend, and Marine Discoveries in Newport, could be documented and distributed (possibly in association with Travel Oregon). Research the basis of success for such leading nature-based products and other international examples of best practice in this interest area.

Action 2.5 Develop further highly-innovative wildlife experiences (including interpretive facilities) that capture the imaginations of visitors as well as national and international recognition and publicity

Today, visitors can choose from a world of competing leisure and entertainment options, with the form of these often crossing over from one traditional context to another (e.g., cruising, entertainment, food, on board rock climbing walls, etc.). Visitors are far more discerning and aware of an explosive growth in these available options. Therefore, in the context of beautiful natural environments and wildlife viewing opportunities, it is no longer simply the beauty and the wildlife alone that can constitute the extent of the experience, but the way in which the experience itself is provided and accessed. An example is the tree top canopy walks that have been designed around the world, some seemingly offering an intrinsic (but safe) sense of danger as part of their appeal. Another good example is the Bureau of Land Management’s (BLM) Cascades Streamwatch (Wildwood Recreation Area) facility near Mount Hood, where the viewer can look into the side of the stream at young salmon in which they are living. Exploring exciting new ‘world standard’ opportunities here for a range of suitable wildlife experiences jointly with other partners or private investors is a serious investment option for regions and locations that possess the right mix of wider tourism destination, product, and marketing qualities. The development of trails, such as the Birding Trails of Oregon, warrants an exploration of the opportunities for innovation and thorough implementation of the trails’ on-the-ground features (e.g., signage, interpretation, guide books, trail distribution, and cross promotion of companion needs like accommodation and food, equipment supplies, etc.).

Potential focus areas for innovation could also include innovative visitor interpretation developments, exciting new wildlife observation facilities and tours, or even new joint ventures with private industry over nature-based accommodation options adjacent to high-interest natural environments.

Action 2.6. Adopting a proactive leadership role on sustainable wildlife tourism practices and opportunities in Oregon and exploring further related partnership and alliance opportunities

Investigate joint project possibilities of mutual interest between partners. Identify overlapping areas of visitor/community-related policy, planning, and development activity. Exchange research and policy insights as well as knowledge of new development opportunities. Agencies' day-to-day policy decisions (e.g., timing of hunting and fishing seasons) can prove of great importance and benefit to tourism in Oregon. Regular liaison with Travel Oregon and Oregon's tourism industry (including regional Destination Management Organizations) could be helpful in addressing potentially unforeseen impacts to tourism.

Over time, partnership development with the tourism industry could generate sufficient revenues to some wildlife/nature-based industry tour operators (e.g., whale/marine watching) to permit them to contribute to conservation and scientific activities surrounding those experiences.

Further, tourism and economic development options might include an exploration of how to advance partnerships with local and regional festivals with a nature- or wildlife-based theme – to help these become stronger in appeal and more successful for their communities and for the programs that support them.

Building closer working relationships with the convention/conference and meetings tourism sector to expand the available conference leisure options for business and other visitors is a further possibility. Partnering with tourism operators to build greater visitor and community awareness of conservation issues, practices, and participation opportunities is another.

Partnering efforts with regions and communities can help allay their possible fears of the negative effects of tourism – fear of invasion or loss of quality of life. The Travel Industry Association of America (TIA) and National Geographic Traveler have identified a highly significant new values-based tourism market, “Geotourism”, that treads lightly and values community concerns here. The key need is to manage the types of tourism sought – and focus on target markets that will benefit people and places, not harm them.

Action 2.7. Planning for sustainable wildlife-related tourism and growth

Affirm the known tourism industry and community desires in Oregon for a sustainable approach to tourism development in the state's regions and a planned approach to tourism growth. In pursuing such a goal, consider the merits of adapting or utilizing an existing model of best practice (such as that developed for conservation-based industry accreditation by Ecotourism Australia, which has also been providing similar policy development services to the World Tourism Organization).

In accordance with industry feedback, consider developing an ‘Oregon model’ for wildlife tourism planning, along with a widely available charter identifying its key development values and principles. Sustainable tourism policy positions have been actively adopted by many leading destinations and states around the western world and beyond (e.g., Costa Rica). Their governments and industry leaders share the view, apparently strongly shared by the Oregon tourism industry, that it is essential to protect significant community and tourism assets if the industry is to continue to prosper well into the future. Such policies also serve to maintain visitor satisfaction and community goodwill. Oregon’s tourism industry leaders share the view that staying true to Oregon’s natural and civic heritage and character will provide the best tourism opportunities.

Such a best practice model would be instrumental in helping retain Oregon’s sense of distinctiveness (Keeping Oregon ‘Oregon’) and the essential qualities and way of life that make the state and its regions so appealing to local communities and visitors alike. It would draw on and reflect these authentic qualities and Oregonians’ most prized community values – including their pride in the state’s comparatively unspoiled natural beauty and protected wildlife.

Fish and Wildlife-Based Tourism Additional Resources

- [ODFW Visitors’ Guide, viewing map, and weekly recreation reports](#)
- [Wildlife viewing opportunities in Oregon](#)
- [2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation National Overview, Oregon Chapter, Revised January 2014](#)
- [2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation National Overview](#)
- [ODFW economic impact information](#)
- [Fishing, Hunting, Wildlife Viewing, and Shellfishing in Oregon: 2008 State and County Expenditure Estimates](#)

HUMAN DIMENSIONS OF FISH AND WILDLIFE CONSERVATION

Social science research can support conservation by increasing understanding of what connects people to nature, how people view conservation, what conservation actions appeal to them, and how to build public interest in stewardship. Cultural background influences perspectives on conservation, as well as how to best communicate with various publics. As Oregon’s population continues to become more diverse, conservation outreach will increasingly need to consider the broader spectrum of cultural values.

Environmental education and fish and wildlife-based tourism programs should be monitored via human dimensions research to determine if they appeal to people, if they are meeting their goals, and how they can be improved. Lastly, it is important to better understand what landowners need and want to

support voluntary conservation on their land. Conservation partners need to work with landowners in determining the most appropriate conservation design or methods to make conservation work better on the ground.

Human Dimensions in Wildlife is an emerging field of study that blends the social sciences and natural resource management to answer these kinds of questions. Relevant information can be collected through a variety of methods, including surveys, focus groups, structured interviews, workshops, etc. Target audiences include consumptive users (e.g., hunters), non-consumptive users (e.g., bird watchers), urban/rural residents, private landowners, and business owners, among others. **Partnerships** with universities that do public policy and other social research can help to address some of these information needs.

STRATEGY SPOTLIGHT: BIRD FESTIVALS

Bird watchers spend \$36 billion annually in pursuit of their hobby. In doing so, they contribute significantly to the economies of the birding places they visit in Oregon. Along with their binoculars and cameras, bird watchers bring their dollars to spend on food, lodging, entertainment, gifts, and other services. Many birders pursue their passion throughout the year, individually or in small groups. At particular times of year, many birders come together for bird-orientated festivals and events. Below are some current examples occurring in Oregon.

[Oregon Shorebird Festival](#)

During late summer, a large number and variety of shorebirds gather on Oregon's mudflats and beaches, resting and refueling during their long migrations. The annual Oregon Shorebird Festival, which celebrates this phenomenon, attracts birders from all over the Northwest and has been running annually in September for 20 years. The festival is held in Charleston, Oregon, and is hosted by the Oregon Institute of Marine Biology and the U.S. Fish and Wildlife Service.

The festival typically offers lectures, guided field trips, charter boat trips, and family activities. People come to find a rare bird, to sharpen their skills and knowledge, or just to enjoy a bird-themed trip to the coast. The migrant shorebirds you can expect to see include Black-bellied Plover, Semi-palmated Plover, Pacific Golden-Plover, Western Sandpiper, Least Sandpiper, Dunlin, Whimbrel, Long-billed Dowitcher, and Red-necked Phalarope. There are also presentations, and a pelagic marine mammal/seabird trip is included most years. The festival is sponsored by the [U.S. Fish and Wildlife Service](#), [Shoreline Education for Awareness](#), [Cape Arago Audubon Society](#), [The Bird Guide, Inc.](#), [South Slough National Estuarine Research Reserve](#), and the [Oregon Institute of Marine Biology](#).

Winter Wings Festival

The Winter Wings Festival occurs in the Klamath Falls area of Klamath County in southern Oregon each February. It filled a void left by the previous Klamath Basin Bald Eagle Conference held in Klamath Falls, which ran annually for 25 years. The festival embraces nature in southern Oregon and attracts birders, photographers, and those who wish to experience spectacular views of wintering waterfowl, Bald Eagles, and nearby places – National Wildlife Refuges, Lava Beds National Monument, Crater Lake National Park, and Lake of the Woods. The festival occurs over four or so days and includes workshops, mini-sessions, field trips, receptions, keynote presentations, vendors, and hands-on activities for birders, photographers, and families. The Klamath Basin of northern California and south-central Oregon is world famous for spectacular flocks of waterfowl, the Klamath Basin National Wildlife Refuges, and the largest concentration of wintering Bald Eagles in the lower 48 states.

John Scharff Migratory Bird Festival

The John Scharff Migratory Bird Festival, centered in Burns in the Harney Basin of southeast Oregon, has been running for over 30 years each April. It features the spectacular spring migration of thousands of migratory birds as they rest and feed in the wide open spaces of Oregon's high desert. The festival offers birding activities as well as historical and cultural exhibits and talks. It celebrates John Scharff, who managed the U.S. Fish and Wildlife Service's Malheur National Wildlife Refuge for 34 years. The festival is sponsored by [Harney County Chamber of Commerce](#), [Malheur National Wildlife Refuge](#), [Bureau of Land Management](#), [U.S. Forest Service](#), [Ducks Unlimited](#), [Harney Birder](#), [International Crane Foundation](#), [Oregon Birding Association](#), [Oregon Department of Fish and Wildlife](#), [National Audubon Society](#), [Audubon Society of Portland](#), [East Cascades Audubon Society](#), [Malheur Wildlife Associates](#), and the [World Center for Birds of Prey](#).

Mountain Bird Festival

This award-winning festival hosted by the Klamath Bird Observatory is held each May in Ashland, Oregon. It combines a celebration of the region's spectacular mountain birds with the conservation of the spectacular landscape. It offers guided bird walks, keynote presentations, fine art galleries, cocktail parties, music, local foods, and a feel-good community atmosphere.

Klamath Falls Annual International Migratory Bird Day Festival

The Klamath Falls International Migratory Bird Day Festival is a free event that is a day of fun and learning for the entire family. Activities include guided bird walks, a mist-netting station, bird house construction, live birds of prey, many children's activities, bird-related displays, arts and crafts, live music, and good food. The primary focus of the event is to expose kids and adults alike to the wonder of migratory birds. The event is held at Veterans Park, along Lake Euwana in downtown Klamath Falls.

Woodpecker Weekend

The Dean Hale Woodpecker Festival is held in June in Sisters, Oregon. The festival is sponsored by the East Cascades Audubon Society and focused its theme on 11 native woodpecker species that occur in central Oregon. The festival hosts a range of birding trips in the central Cascade Mountains and often finds over 200 bird species.

Oregon Birding Trails

The trails provide self-guided birding in some of the very best areas in the state. There are five trails already operating: the Oregon Coast, Cascades, Klamath Basin, Basin and Range, and Willamette Valley. There are five additional trails planned or in the concept phase.



Photo Credit: Kathy Pendergrass, NRCS

VOLUNTARY CONSERVATION PROGRAMS

In Oregon, there are dozens of voluntary programs that contribute to habitat conservation across the state. Government programs can be funded and administered by the state, federally-funded but state-administered, or federally-funded and administered. Some private or nonprofit organizations also offer conservation incentives.

STATE VOLUNTARY CONSERVATION PROGRAMS

ODFW grants and tax incentives

ODFW Access and Habitat Program

This program, administered by the ODFW, provides direct funding to improve wildlife habitat, increase public hunting access to private lands, or solve wildlife damage issues. Projects can be implemented on private or public lands. Projects include improvement of vegetation on wild lands, development of wetland habitat, noxious weed control, improving wildlife forage on private lands, development of water in arid regions, reclamation of habitat by vehicular restrictions, seeding after wildfire, hunting leases, land acquisition, seasonal road management and hunter access through private lands to inaccessible public lands, or fencing to control wildlife or livestock. Projects are given high priority if they reduce economic loss to landowners and involve funding commitments or in-kind contributions from other organizations and agencies.

ODFW Wildlife Habitat Conservation and Management Program

This program provides property tax benefits and technical assistance to landowners. Participating counties and cities identify farmland, forestland, and/or other significant habitats and ask the ODFW to designate these lands as eligible for the program. An eligible landowner develops a fish and wildlife management plan approved by ODFW. The property receives a wildlife habitat special assessment, and is assessed for property taxes as if the land was being farmed or used for commercial forestry. Farming

and forestry may continue, as long as they are compatible with fish and wildlife objectives of the management plan. For most landowners, this program allows their property to be used for conservation, and the property shifts from farm or forest special assessment to wildlife habitat special assessment. The program does not provide cost-share, grant, or rental payments to landowners. Leaving the program may obligate the landowner to back taxes if the property is not eligible for another special assessment category.

ODFW Restoration and Enhancement Program

The Restoration and Enhancement Program is a grant program that provides \$2-3 million per year to fishery projects throughout Oregon. It supports increased recreational fishing opportunities and works to improve the commercial salmon fishery. The restoration program focuses on projects to repair and replace fish production equipment and facilities, and on collecting information on physical and biological characteristics of streams, lakes, or estuaries. The enhancement program focuses on projects to increase fish production (either hatchery or natural production), increase recreational or commercial opportunities or access to the fish resources, or improve fish management capabilities. Any public or private nonprofit organization may request funds to implement fish restoration or enhancement projects.

ODFW Fish Screening or Passage Cost Share Grant

Oregon water users may be eligible for an ODFW cost-share incentive program and state tax credit designed to promote the installation of agency-approved fish screening or fish passage devices in water diversions. Funds for fish screening and passage projects are to be used to share costs with applicants.

ODFW Riparian Lands Tax Incentive Program

This property tax program offers a property tax exemption for riparian land up to 100 feet from a stream. Landowners conserve and restore riparian lands to protect the economic and ecological benefits to soil, water, fish, and wildlife. For riparian land to qualify for this program, it must be outside adopted urban growth boundaries, and zoned for forest or agricultural use. Landowners within urban growth boundaries may qualify if individual cities choose to participate.

Western Oregon Stream Restoration Program

This program provides direct technical support to watershed councils and private landowners in western Oregon to implement **Oregon Plan** measures directing the restoration and enhancement of Oregon's salmonid habitats in the region.

ODF and ODA Stewardship Agreement Program

A landowner may enter into a voluntary stewardship agreement with the **Oregon Department of Forestry** (ODF) and/or the **Oregon Department of Agriculture** (ODA), whereby they agree to meet and

exceed applicable regulatory requirements and to conserve, restore, and improve fish and wildlife habitat or water quality. A stewardship agreement is a voluntary written plan, with authority designated within state statutes, whereby a landowner agrees to meet the natural resource protection standards of the Oregon Forest Practices Act through alternate practices. The program provides incentives for landowners who voluntarily meet and exceed regulatory requirements to improve wildlife habitat and water quality. Landowners and the State Forester work collaboratively to create long-term agreements that consider natural resource conservation and routine forest management from a property-wide perspective, rather than at the scale of single projects. Stewardship Agreements were authorized by the 2006 Oregon legislature. The legislative change recognized that in a time of dynamic change in scientific information and social values, improvements to fish and wildlife habitat and water quality cannot succeed through laws and government actions alone. The program was developed to enhance what the legislature described as a characteristically Oregonian “spirit of volunteerism and stewardship”.

OWEB Grants

Since 1999, the Oregon Watershed Enhancement Board (OWEB) has provided grants to help Oregonians take care of local streams, rivers, wetlands, and natural areas. Community members and landowners use scientific criteria to decide jointly what needs to be done to conserve and improve rivers and natural habitat in the places where they live. OWEB grants are funded from the Oregon Lottery, federal dollars, and salmon license plate revenue. The OWEB’s strategic plan (2010) is intended to provide high-level strategic guidance and direction to help restore and protect Oregon’s watersheds in light of significant driving forces like human use, population growth, urbanization, and climate change, and ensures priorities are aligned with those developed in the Conservation Strategy.

Types of grants in the regular grant program include:

- Protecting Land
- Protecting Water
- Outreach
- Monitoring
- Restoration
- Technical Assistance

FEDERAL CONSERVATION PROGRAMS IN OREGON

Farm Bill Programs

The Agricultural Act of 2014 (The Farm Bill) is a comprehensive federal bill which is reauthorized every five years. The most recent reauthorization was in 2014. The Farm Bill is among the largest sources of conservation funding in the federal government. It provides producers with financial and technical

assistance and promotes conservation stewardship. The Bill provides funding through such programs as the [Conservation Reserve Program](#) (CRP), [Grassland Reserve Program](#) (GRP), [Wetland Reserve Program](#) (WRP), and [Wildlife Habitat Incentive Program](#) (WHIP). Hundreds of millions of dollars are available to private landowners to keep wetlands, grasslands, and other fragile lands protected as wildlife habitat.

The CRP pays farmers annual rental payments under 10-15 year contracts to set aside marginal land. The GRP is a voluntary program that enables landowners to restore or protect native grasslands on portions of their property. Grasslands are valuable wildlife habitat currently in decline. WRP allows interested farmers the opportunity to restore, maintain, and protect wetlands on their property. Most lands restored under WRP are marginal, high risk, flood-prone lands that wouldn't be suitable for growing crops. The WRP enables landowners to take these lands out of production and restore them to beneficial use as wetland wildlife habitat.

- [All Farm Bill 2014 Programs](#)
- [A Guide to the Farm Bill Conservation Programs](#), prepared by Defenders of Wildlife
- [Payments for Wildlife and Biodiversity Outcomes under Farm Bill Programs](#), prepared by Defenders of Wildlife
- [2014 Farm Bill Field Guide to Fish and Wildlife Conservation](#), prepared by North American Bird Conservation Initiative, is a tool to assist the staff of federal and state fish and wildlife agencies, non-governmental conservation organizations, joint ventures, and other conservation partners in implementing Farm Bill conservation programs. It is primarily designed for those who work collaboratively with private landowners and agricultural producers to improve soil health, water quality, and fish and wildlife habitat.

Easements

[Agricultural Conservation Easement Program](#)

The Agricultural Conservation Easement Program provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, the Natural Resources Conservation Service (NRCS) helps Indian tribes, state and local governments, and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect, and enhance enrolled wetlands.

[Healthy Forest Reserve Program](#)

The focus of the Healthy Forest Reserve Program (HFRP) is to encourage landowners to manage their land for sustainable, profitable timber harvests while promoting forest conditions that improve habitat for the threatened Northern Spotted Owl. Participating landowners will receive long-term assurances

that no additional regulatory restrictions under the Endangered Species Act will be imposed beyond the current, baseline conditions if they follow a plan that benefits Northern Spotted Owls. In Oregon, HFRP has enrolled lands in Lane, Coos, Douglas, Josephine, Curry, and Jackson Counties. HFRP is a voluntary program established for the purpose of restoring and enhancing forest ecosystems to promote the recovery of threatened and endangered species, improve biodiversity, and enhance carbon sequestration.

Financial Assistance

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is administered by the NRCS and aims to promote agricultural production and environmental quality as compatible goals. The program provides technical and financial assistance to farmers and ranchers to implement conservation practices on their lands. EQIP has four national priorities: reducing non-point source water pollution, reducing air emissions, reducing soil erosion, and promoting habitat for at-risk species. Each state develops more specific statewide and local priorities. Private land in agricultural production is eligible for this program with an approved plan and a contract for one to ten years. Practices are based on a set of national priorities that are adapted to each state.

Conservation Stewardship Program

The NRCS Conservation Stewardship Program (CSP) helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resources concerns. Participants earn CSP payments for conservation performance – the higher the performance, the higher the payment.

Regional Conservation Partnership Program

The Regional Conservation Partnership Program promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

Other Programs

Conservation Innovation Grants

Conservation Innovation Grants (CIG) is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies, while leveraging federal investment in environmental enhancement and protection. Under CIG, EQIP funds are used to award competitive grants to non-federal governmental or non-governmental organizations, tribes, or individuals.

Technical Service Providers

The Voluntary Public Access and Habitat Incentive Program

Forest Legacy Program

The Forest Legacy Program is administered by the U.S. Forest Service (USFS) and individual states to protect private forestlands from conversion to non-forest uses, and to ensure that both economic uses of private forestlands and the public benefits they provide are protected for future generations. Forestland can be conserved through purchase of a conservation easement, which acquires the landowner's development rights and allows the land to remain in private ownership, or through purchase in fee simple. Each state develops an assessment of need that identifies high-priority private forestlands to protect. To receive federal funding, states submit an application package to the USFS, which uses a competitive process in distributing grant funds. The program funds up to 75 percent of project costs.

The program operates in designated Forest Legacy Areas where important forests may be lost to non-forest uses. The Forest Legacy Program seeks projects that strengthen local communities through state, local, and private partnerships in conservation. Landowner participation in the Forest Legacy Program is voluntary. In 2001, an Assessment of Need for Oregon was developed cooperatively by the ODF, the Oregon Natural Heritage Program, and the USFS. The assessment identified 15 Forest Legacy Areas where private forestland is significantly threatened by potential conversion to residential, urban, and other non-forest uses within the next 10 years. The Forest Legacy Areas, which cover about 13 percent of Oregon's private forestland, were chosen to focus efforts where important forest resources are at risk. Ecological, social, and economic factors were considered in identifying and prioritizing the Forest Legacy Areas.

The 15 Forest Legacy Areas occur in 5 ecoregions: Coast Range (2), Willamette Valley (6), Klamath Mountains (3), East Cascades (3), and Blue Mountains (1). The habitat priorities in each ecoregion correspond closely to the forest Strategy Habitats identified in this document.

- **Coast Range**: Forest Legacy Areas include forest habitats dominated in different areas by Sitka spruce, shore pine, Port-Orford cedar, Oregon white oak, tan oak, grand fir, Douglas-fir, and coast redwood. Other important habitats include wetlands, saltmarshes, and coastal dunes.
- **Willamette Valley**: Forest Legacy Areas include oak woodlands, oak savannas, riparian and floodplain forests, mixed forests, and conifer forests. Forest Legacy Areas cover most of the Willamette Valley because these forest types occur across the landscape and most of this ecoregion is privately-owned.
- **Klamath Mountains**: Forest Legacy Areas include oak woodlands, oak savannas, white oak/black oak/madrone forests, low-elevation ponderosa pine forests and woodlands, mixed forests,

riparian bottomland forests, knobcone pine, Jeffrey pine, Port-Orford cedar, and canyon live oak.

- **East Cascades**: Forest Legacy Areas include oak woodlands, oak savannas, oak/ponderosa pine forests, ponderosa pine forests and woodlands, and riparian and wetland habitats.
- **Blue Mountains**: Forest Legacy Areas include riparian and bottomland woodlands with cottonwood, alder, aspen, and spruce.

North American Wetlands Conservation Act

This program provides funding to promote conservation of wetlands and associated habitats for migratory birds, fish, and other wildlife. A funded grant, with partner match, serves as a four-year plan of action to conserve wetlands and wetland-dependent fish and wildlife through acquisition, easements, restoration, and/or enhancement. The application process is rigorous but provides substantial funding, between \$50,000 and \$1,000,000. A small grants program designed as a stepping stone to help applicants prepare for larger projects provides grants up to \$50,000. Projects must include adequate wetlands-associated uplands to buffer and protect conserved wetlands and to meet the needs of wetland-associated fish and wildlife.

Partners for Fish and Wildlife

This USFWS program provides cost-share funding and/or technical assistance for voluntary restoration of fish and wildlife habitats on private land (including non-state and non-federal land). Projects are designed to restore native habitat to function as naturally as possible, preferably resulting in a self-sustaining system. Projects focus on habitats that benefit migratory birds, migratory fish, or federally-threatened and endangered species, or on habitats that are designated as globally- or nationally-imperiled. High priority projects also complement habitat functions on National Wildlife Refuges, occur in areas identified by state fish and wildlife agencies and other partners, or reduce habitat fragmentation.

There is no formal application process. Instead, an interested landowner contacts the state program coordinator and they work together, along with public and private conservation partners, to develop the project. Program funds are used for sharing restoration project costs and are not available to lease, rent, or purchase property. Landowners commit to retain the restoration project for at least 10 years.

Funding for this program is allocated for all states, with \$36 million available nationally in 2015. In Oregon, this program restores wetlands, oak savanna, floodplain, wet prairie, shrub-steppe, riparian areas, and in-stream habitat restoration and fish passage in numerous areas around the state.

State Wildlife Grants and Teaming with Wildlife

Through the State and Tribal Wildlife Grants Program, the USFWS provides annual grants to states, territories, and tribes to support cost-effective conservation aimed at keeping wildlife from becoming

endangered. The funding is allocated based on land area and population, with Oregon receiving about \$863,000 in 2014 and almost \$13 million since the program began. In 2014, about \$58 million was available to the states, while about \$4 million was available to federally-recognized tribes. Currently, these funds are used to support planning and implementation of key fish and wildlife efforts by funding ODFW staff positions. A comprehensive summary of grant programs administered by the USFWS can be found [here](#).

STRATEGY SPOTLIGHT: ECOSYSTEM SERVICES MARKETS

Ecosystem services are the benefits that nature provides, such as purifying and cooling water or storing carbon dioxide. Worldwide, there is growing interest in harnessing market forces to drive conservation and restoration. Market-based approaches to ecosystem services can:

- Provide a pivotal link between people willing to pay for actions that improve and protect our environment and those who can take those actions.
- Identify specific environmental products and services that result from restoring and protecting our environment. In much the same way that farmers can describe the specific quantity and quality of crops they grow, they can also now describe the specific quantity and quality of environmental products and services they can create, like fish and wildlife habitat and water storage and purification.
- Create economic incentives for cities, industries, and businesses that have unavoidable impacts on the environment to fund meaningful conservation and restoration actions.
- Create opportunities to pay the people who can restore and maintain ecosystem services.
- Target conservation and restoration toward the most beneficial locations.
- Involve the private sector in conservation and restoration and increase cooperation among diverse parties, such as business, environmental, and agricultural interests.
- Marry the economy and the environment, creating new business opportunities while increasing the pace, scope, and effectiveness of conservation and restoration.

How ecosystem services markets work

The concept behind ecosystem services markets is fairly simple. Environmental regulations set standards to protect natural resources. Industries, businesses, developers, and individuals who change the land or water must either meet these regulatory standards or compensate for the impacts they cannot avoid.

For example, a developer who cannot avoid impacts to a wetland must replace it, either on site or elsewhere. Cities and industries must clean and cool wastewater before releasing it into a river.

Where impacts cannot be avoided completely or where a resource can be better protected elsewhere, ecosystem services markets provide a way for regulated parties (buyers) to pay other land and water managers (sellers) to restore wetlands, reconnect river floodplains, preserve prairies and forests, plant trees along streams, or improve the ecosystem in other ways.

Is this for real?

Ecosystem services markets are already in place in Oregon, the United States, and elsewhere in the world. Here are some examples:

- In Oregon, wetland mitigation banks are allowed to sell credits to offset unavoidable impacts to a natural wetland impaired by a development project.
- In Oregon's Tualatin River basin, a water resources agency avoided investing more than \$60 million in technological upgrades by restoring 35 miles of 150-foot-wide stream buffers and paying farmers competitive rates for using their land for restoration.
- The U.S. Fish and Wildlife Service developed a conservation banking program that allows developers who cannot avoid causing adverse effects to endangered species to invest in banks elsewhere that restore or protect equivalent habitat. Most of these banks are in California, but the Oregon Department of Transportation developed a conservation bank to conserve [Oregon chub](#). The chub were officially the first fish to be [removed](#) from the federal Endangered Species List as a result of population recovery.
- The Kyoto Protocol stimulated the development of a cap-and-trade system for carbon dioxide emissions in most industrialized countries, although not in the United States.

For more information on ecosystems services and market-based approaches to conservation, see the [Willamette Partnership](#) and the [Freshwater Trust](#).



Photo Credit: Amos Meron, Wikimedia

CONSERVATION IN URBAN AREAS

OVERVIEW

Many landscape features that increase livability for people can also play an important role in sustaining native wildlife populations. Cities are often built in close proximity to features important to fish and wildlife habitats, such as the confluence of rivers. While urban development can fragment larger habitat areas, urban areas can contain key natural areas and features that offer significant benefits to fish and wildlife. The role for urban ecosystems in fish and wildlife conservation has become increasingly recognized in recent decades. Public greenspaces set aside in urban areas engage people in nature and enable residents to enjoy the outdoors where they live and work. This builds an awareness of habitat conservation and restoration actions that they can see every day.

Oregon's urban areas cover approximately 6 percent of the state, and the U.S. Census Bureau states that over 75 percent of Oregon's population lives in metropolitan areas. Oregon is becoming more culturally, racially, and ethnically diverse, and conservation messages need to be expanded to reach this increasingly diverse audience. Portland is Oregon's largest urban center, and has been recognized as a national model for urban natural resource planning. Many towns and cities across the state are expanding to respond to the needs of a growing population, and rural farms and forests continue to be converted to urban and industrial uses.

Urban areas are characterized by the prevalence of built structures and impervious surfaces, which alter surfaces and water flow, degrade water quality, reduce vegetation cover and diversity, and cause habitat loss, fragmentation, and degradation. Urban areas are also centers of human activities that can displace sensitive fish and wildlife, introduce and spread invasive species, generate pollutants, noise, heat, and artificial lighting that can disturb wildlife, and pose hazards to wildlife from people, roads, pets, buildings, and other factors. Cities and municipalities are increasingly working to decrease many of these problems through best practices and through outreach and education.

Conservation in Urban Areas

Urban areas can contribute to conservation goals in a number of ways. They can maintain ecologically important natural areas inside of urban growth boundaries, and contain or direct growth in ways that protect habitat in more rural areas. Urban areas can promote “green” buildings, reducing hazards such as buildings prone to **bird strikes**. Partners can work collaboratively on developing a green infrastructure in urban areas, which is an interconnected network of protected natural areas and features designed to support native species, maintain natural ecological processes, sustain air and water resources, and contribute to the health and quality of life in our communities. Urban residents can be engaged in restoration activities at the backyard, neighborhood, and watershed scales. Urban areas provide tremendous opportunities for reaching and engaging the public in wildlife conservation efforts both within and beyond their local communities.

Cities offer a great challenge, to sustain fish and wildlife species and habitats under developed conditions bustling with human activity, as well as a great opportunity, to engage people with nature and contribute to larger-scale conservation needs. While urbanized lands already have impacted today’s conservation opportunities, and future urbanization likely will present further challenges, some of Oregon’s urban areas have made impressive efforts to contribute toward fish and wildlife conservation. Significant habitats have been set aside through parks and greenspaces programs in places such as the Portland Metro region and the Eugene area, and wildlife species and habitat considerations are increasingly becoming part of land use planning processes and resulting development patterns. Moreover, parks and greenspaces can also have the added benefit of improving property values and livability.

The full array of Oregon’s aquatic and terrestrial habitats are found in urban areas, including oak woodlands and savannas, native grasslands and sagebrush, bottomland hardwood forests, coniferous forests, and other important habitats. Urban streams and riparian areas support salmon and trout as well as other native fish, and a host of amphibians, reptiles, mammals, birds, and invertebrates. The largest runs of anadromous fish in the Pacific Northwest use the Columbia and Willamette Rivers, which both go through urban areas, including the Portland Metro region. The Willamette River, which supports many important fisheries and wildlife species, also runs through Salem and Eugene. Protecting and restoring these important habitats and species in urban areas will not only help to conserve Oregon’s natural heritage, but will also provide valued ecosystem services for the public.

Urban areas have an important role to play in imperiled species protection and recovery. Many imperiled plant and animal species occur in urban areas. For example, the Eugene area serves as a stronghold for many federally-listed prairie species; the recently federally-listed Streaked Horned Lark is found in mostly urban and agricultural habitats. Some of the largest populations of sensitive painted turtles are found in urban areas. The formerly threatened but now delisted Peregrine Falcon benefited from using artificial nesting structures, such as bridges, in urban areas.

Human-created habitats can also provide significant habitat for wildlife in urban areas. For example, green infrastructure strategies, such as protecting riparian corridors and floodplains, building green roofs, and establishing urban tree canopy, provide environmental and community benefits. Native plant gardens and native landscaping, backyard ponds, and bat and bird roost and nest sites on buildings, bridges, and utility poles can provide places for some wildlife species to feed and rest. The ODFW's [Naturescaping](#) book has information on providing habitat in urban areas. Creating backyard habitats and building habitat features into existing structures are excellent approaches for supplementing natural habitats in urbanized areas (for example, see [the Audubon Society of Portland/Columbia Land Trust Backyard Habitat Certification Program](#)). In addition, setting aside functional habitats and enabling the use of that habitat by incorporating design features, such as wildlife corridors and safe road crossings, can help to accommodate the needs of fish and wildlife within the built environment. Finally, knowledge of the smaller or less mobile species that may be present while doing work around the house clearing brush, burning brush piles, moving rock piles, or putting in structures or utility lines can minimize negative impacts to species (for example, see ODFW's [Native Turtle Best Management Practices](#)).

LIMITING FACTORS AND RECOMMENDED APPROACHES

Limiting Factor: Limited Natural Areas

Recommended Approach

Protect and restore natural areas that are connected with each other and to the larger landscape. Park and greenspace programs provide excellent opportunities for building fish and wildlife habitat into urban areas, while contributing to people's recreational opportunities and quality of life. The Intertwine Alliance is an innovative collaboration between local governments, community planners, state and federal agencies, non-governmental organizations, local residents, and businesses that is working on building and promoting a connected system of parks, natural areas, and trails throughout the greater Portland/Vancouver region. The Intertwine Alliance has produced a [Regional Conservation Strategy](#) and [Biodiversity Guide](#) for the region. Eugene, Corvallis, Bend, and other cities are also incorporating networks of greenspaces and trails into their park programs.

Limiting Factor: Need for Additional Education and Outreach

Urban areas are where most people live, presenting an unparalleled opportunity to reach, serve, and support a large segment of Oregon's population. Education has tremendous value as a means of informing landowners, voters, visitors, politicians, and other decision-makers and stakeholders about ways they can contribute toward fish and wildlife conservation.

Recommended Approaches

Direct resources towards populated and ethnically diverse areas to educate Oregonians about Oregon's natural heritage, show people real-world examples of important habitats and projects, and build an appreciation that will lead to citizen actions and support for conservation. Stewardship, involvement in restoration projects, and opportunities to view fish and wildlife and experience nature can have high value when experienced as part of people's daily lives. Additionally, protecting nature in cities provides opportunities for education and outreach close to home that may not otherwise be available to the general public.

Provide instruction, guides, and Best Management Practices to maintenance and operations staff in municipalities. Guidance about small actions, such as [**Avoiding Impacts on Nesting Birds During Construction and Revegetation Projects**](#), and details on how and when to remove a tree, clear brush, use pesticides, or work on utilities or sewers, can add up to big benefits for Oregon's native fish and wildlife. Outreach about the impacts of outdoor cats can help residents understand their role in stewardship of native wildlife. Promote urban greenspaces programs that provide the public a local opportunity to enjoy wildlife and open space which will help limit use of more natural areas outside urban centers. Encourage urban residents to appreciate and engage in outdoor activities.

Limiting Factor: Wildlife Hazards

Urban landscapes can present a variety of hazards for wildlife, such as bird collisions with windows, vehicles, and powerlines, impacts due to light pollution, predation and disturbance by pets, 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 municipalities 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 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 nonprofit organizations can promote bird-safe building design and outreach efforts about the impacts of cats on wildlife.

Limiting Factor: People-Wildlife Conflicts

Where humans and wildlife live in close proximity, conflicts can occur. These can include destruction of property, nuisance due to noise, defecation, predation on pets, and injuries to people. Many of these conflicts occur because of lack of understanding about wildlife. For example, feeding wildlife or interference with young wildlife can lead to destructive behavior patterns. These conflicts lower public support for wildlife conservation.

Recommended Approach

Support and expand existing programs to provide information on preventing and resolving conflicts with wildlife. Provide [outreach resources](#) about “living with wildlife”, which should be tailored to local communities.

Limiting Factor: Paved Surfaces Alter Hydrology and Prevent Filtering of Pollutants

In cities, large expanses of landscape are covered by paved impervious surfaces, creating challenges for managing stormwater runoff in ways that protect watershed and stream health. Resulting hydrological alterations can have significant impacts on the surrounding lands. Development also tends to encroach into riparian areas and floodplains that are known to provide critical functions for maintaining healthy streams and key fish and wildlife habitats.

Recommended Approach

Develop and implement green infrastructure strategies, such as maintaining important natural areas (e.g., riparian corridors, wetlands, floodplains, and upland forests) and incorporating green streets, green roofs, urban tree canopy, and other sustainable stormwater management strategies into the built environment. Work within Oregon’s planning and regulatory framework to protect stream corridors, riparian areas, and floodplains. When needed, support mitigation actions. Seek ways to incorporate ecological considerations into development activities.

Limiting Factor: Stakeholder Involvement

With the majority of Oregon’s population living in developed urban areas, there is a critical need to engage with urban residents about conservation issues. There is potential to reach many stakeholders in urban areas from the private sector, such as landowners, businesses, and the industrial community.

Recommended Approach

Expand efforts to reach under-served and increasingly diverse communities. Encourage stakeholder involvement and concern for conservation issues by recognizing the positive local contributions that individuals, businesses, and industry have made by informing them of conservation opportunities and by continuing dialogue. Focus on local issues to keep people engaged, and link local efforts to larger landscapes when there is interest and opportunity.

Limiting Factor: Multiple Jurisdictions

Fish and wildlife and conservation issues cross land ownerships and jurisdictional boundaries (cities, counties, agencies). This presents challenges to conservation because organizations do not always coordinate to address issues that may be ecologically connected, but politically or programmatically separate.

Recommended Approach

Recognizing the uniqueness of each local community and the needs of various landowners, seek methods to achieve cooperation and coordination. Promote the exchange of information and provide guidance to landowners and local communities that can be used in their efforts to protect and restore habitat, set aside green infrastructure systems, and plan urban growth strategies that can help to sustain fish and wildlife populations and ecological function across the landscape. Create cost-share funding opportunities for conservation planning and project implementation.

Limiting Factor: Need to Integrate Social and Ecological Concerns

There is a continuing need to study and address the social (e.g., environmental education and stewardship, environmental economics, etc.) and ecological aspects of conservation in and around urbanizing areas.

Recommended Approach

Increased recognition of the significance of the fields of urban ecology and environmental social sciences will attract research and monitoring attention to studying these issues in and around urban systems. Build partnerships between researchers and data users, and seek resources for research that will increase understanding of how urban systems can be designed to help sustain fish and wildlife populations with a high level of public support and involvement. As the fields of urban ecology and environmental social sciences become more established, more sources of funding can be identified. Applying this information to open space acquisitions, habitat restoration, regional and local land use planning, environmental education, public outreach, and other aspects of conservation is critical for building effective conservation strategies and public support now and into the future.

Limiting Factor: Need for Innovative Restoration Techniques

The types of on-the-ground projects needed to improve habitat in urban areas often go beyond the traditional suite of restoration practices that are most commonly supported by existing funding sources.

Recommended Approach

Support habitat improvement projects geared toward the needs, opportunities, and high level of public interest in carrying out environmentally beneficial projects in urban areas. Provide technical and financial support for projects, such as managing stormwater to more closely mimic natural hydrology, landscaping with native plants, restoring historically important habitats when sites are redeveloped, environmental education and outreach, and other conservation actions. These activities can provide significant opportunities for habitat protection and improvement, and are important for engaging and serving the public.

STRATEGY SPOTLIGHT: INTERTWINE ALLIANCE

The Intertwine Alliance is a coalition of private firms, local governments, public agencies, and nonprofit organizations working together to tap new sources of funding and better leverage existing investments to protect parks, greenspaces, and trails, and more fully engage residents with the outdoors and nature in the greater Portland/Vancouver metropolitan region. As part of The Intertwine Alliance’s work to build and support this broad coalition, they have developed forums for stakeholders to come together to help guide the evolution of parks, natural areas, trails, open spaces, and recreation opportunities and to work together on collaborative projects under a shared vision for the region. **The Intertwine Alliance’s Regional Conservation Strategy** is a detailed description of the natural resource features of the urban landscape and, following the Oregon Conservation Strategy, provides a road map for future conservation efforts on the landscape.



Photo Credit: ODA

PLANNING AND REGULATORY FRAMEWORK

Over the past three decades, Oregonians have come to recognize the degree to which human activity has changed the landscape of our state and affected the fish and wildlife populations. Many efforts to address concerns about species declines have been crisis-driven, focused on individual species, and contingent on available funds.

At the same time, there is a growing recognition among researchers, agencies, and land managers that nature works on many scales. Effectively conserving populations of native species requires strategic and varied approaches that address species and their habitats across broad landscapes as well as local sites.

Responsibility for fish and wildlife conservation planning and regulatory programs is shared by many agencies, organizations, institutions, and individuals. In fact, there are so many entities involved that it is not feasible to describe all of their efforts here. This section addresses activities and responsibilities of state and local government entities and includes larger-scale public/private efforts to plan for and conserve fish, wildlife, and their habitats.

OREGON'S PLANNING EFFORTS

Numerous planning efforts have identified priority species, habitats, and actions within Oregon. Plans have been completed at local, state, and regional levels by agencies, coalitions, and non-governmental organizations. These plans have differed in their purposes, goals, and scales of analysis. These processes, as well as more localized efforts, have built the knowledge base and relationships that set the stage for establishment of a state conservation strategy. The Strategy builds upon these existing efforts with the goal of providing an overarching framework for conservation in Oregon.

Creative planning work has been done at all levels. Plans are produced by federal, state, and local public agencies, private land managers, regional bodies, and local, regional, or watershed volunteer groups. Many agencies have built collaborative alliances and are streamlining processes while investing public

funds more frugally and wisely. Oregon's land use planning program provides a consistent framework for local governments to assess open space and natural area protection.

Many current and recent plans have focused on solving an individual problem, or managing individual species, habitats, or geographical areas. The result is a collection of plans with limited coordination and limited means of addressing landscapes. The broad umbrella of the Strategy offers an opportunity to increase coordination of plans, thereby knitting together efforts across purposes, entities, and scales.

Although the Strategy takes a large-scale view of Oregon's conservation needs, implementation of Strategy priorities will occur at the local level. Linking to local planning and restoration efforts will be an effective way to work toward the Strategy's goals, while providing a greater context and recognition for the efforts of communities. For example, watershed assessments and action plans provide one such opportunity to build bridges across efforts. A number of watershed councils and other local groups have conducted watershed assessments to evaluate the current health and functional values of the watershed in light of historical conditions. The assessments identify conditions that limit aquatic production and function in particular geographic areas. Many groups have developed an action plan for restoration and protection based on their assessment's findings. Implementation of the Strategy will bring technical assistance, improved access to incentive programs, and landscape approaches to complement local knowledge and priorities.

Listed below are some of the major planning efforts for Oregon. This list is not meant to be comprehensive, as there are many plans available, but rather represents the major efforts consulted during development of this Strategy. A few of these efforts are currently in development. For these, either draft plans were reviewed or ODFW Strategy staff met with other planning staff.

Major Statewide Planning Efforts in Oregon

Oregon Plan for Salmon and Watersheds

In 1997, when several stocks of Oregon salmon were proposed for listing under the Endangered Species Act, state officials launched an effort to avoid the listing and its many negative consequences by creating a recovery program unique to Oregon. It has evolved into a broad-scale effort that involves an extensive array of private and public partners and restoration efforts at all scales of government, society, and natural systems.

The Oregon Plan uses funding from the OWEB to create a framework for watershed restoration, salmon recovery, and improvements in water quality. More than \$20 million, primarily derived from lottery funds, is channeled each year through OWEB to a wide variety of voluntary activities across the state that support the Oregon Plan's four primary components:

- Voluntary restoration actions by private landowners
- Coordination between state, federal, and tribal agencies

- Monitoring watershed health, water quality, and salmon recovery
- Scientific oversight by an independent panel of scientists who evaluate the plan’s effectiveness, identify needed changes, and guide research investments

Most of the plan’s focus is on actions to improve water quality and quantity and restore habitat. Watershed councils and Soil and Water Conservation Districts (SWCDs) are the primary facilitators of restoration efforts among local landowners. Many watershed groups have developed detailed, specific local conservation assessments.

The Oregon Gap Analysis Project

The Gap Analysis Program (GAP) brought together the problem-solving capabilities of federal, state, and private scientists to tackle the difficult issues of land cover mapping, vertebrate habitat characterization, assessment, and biodiversity conservation at the state, regional, and national levels. The program seeks to facilitate cooperative development and use of information. For more information on the national GAP program, see the [U.S. Geological Survey \(USGS\)](#).

The [Oregon Gap Analysis Program](#) began work in 1988, as the second GAP program in the nation. It was a collaborative, multi-partner effort to map and analyze vegetation, land ownership, land management, and species distribution. The major goals were to:

- Produce GIS-databases describing actual land cover type, historical land cover type, terrestrial vertebrate species distributions, land stewardship, and land management status at a scale of 1:100,000.
- Identify land cover types and terrestrial vertebrate species that currently are not represented or are under-represented in areas managed for long-term maintenance of biodiversity (i.e., “gaps”).
- Facilitate cooperative development and use of information so that institutions, agencies, and private land owners may be more effective stewards of Oregon’s natural resources. The development of the stewardship coverage and the species distribution databases has improved the ability for others to do statewide and local assessments. The Oregon Biodiversity Information Center (ORBIC), formerly the Oregon Natural Heritage Information Center (ORNHIC), has continually updated the managed area cover and the species distribution databases to provide crosswalks between the new wildlife habitat models and any new vegetation or land cover maps that become available.

The Oregon Biodiversity Project

The Oregon Biodiversity Project was a privately-initiated, collaborative effort envisioned in the early 1990s and launched in 1994 to develop a statewide strategy for conserving biodiversity. This private-sector endeavor engaged public agencies, private organizations, and a broad array of stakeholders to

develop a statewide biodiversity assessment and strategy, which was completed in 1996. In contrast to the conventional approach of addressing endangered species individually, this was an effort to address biodiversity issues more broadly across political boundaries, using computer mapping technology, satellite imagery, and principles of conservation biology. The project was led by the West Coast Office of Defenders of Wildlife in partnership with The Nature Conservancy (TNC), the Natural Heritage Program, and a variety of public and private sector partners. The Oregon Biodiversity Project's primary goal is to develop a pragmatic statewide strategy to conserve Oregon's native biodiversity. The Biodiversity project was intended to reduce the risk of future endangered species designations, and give landowners more flexibility in resource management decisions. The project also has sought to establish a process to improve communication among diverse public and private interests and to help people find common ground in resource management decisions. The result was *Oregon's Living Landscape: Strategies and Opportunities to Conserve Biodiversity*, and other associated products. *Oregon's Living Landscape* described the issues in each ecoregion, identified priority species and habitats, and identified priority conservation areas. For more information on its development, see this [background document](#).

ODFW Wildlife Diversity Plan

The Oregon Fish and Wildlife Commission adopted the Oregon Wildlife Diversity Plan in November 1993 and updated it in January 1999. This plan sets forth the goal, objectives, strategies, sub-strategies, and program priorities for ODFW's Wildlife Conservation Program. Although the focus of this plan is on nongame species, it addresses all fish and wildlife species, both game and nongame. In addition to being a policy document to guide the Wildlife Diversity Program actions, the Oregon Wildlife Diversity Plan is also a reference document containing biological information on fish and wildlife species in the state, habitat information (organized by physiographic provinces), and summaries of state and federal laws and programs affecting fish and wildlife and their habitats.

Oregon Department of Transportation Mitigation and Conservation Bank Strategy

Many local, state, and federal regulatory processes include mitigation requirements for unavoidable impacts to protected resources. Mitigation usually includes restoration, creation, or enhancement of the impacted resource. The Oregon Department of Transportation (ODOT) has developed a comprehensive mitigation and conservation banking strategy to assess natural resource impacts, prioritize mitigation and conservation investments, and provide ecologically valuable mitigation and conservation projects throughout the state. The Mitigation Bank is intended to focus on regional ecological priorities, improve watershed health, improve habitat connectivity, and make meaningful contributions to the recovery of threatened and endangered species.

Oregon Board of Forestry, Forestry Program for Oregon

The Forestry Program for Oregon is a sustainability plan developed by the Board of Forestry along with input from the public. The Board of Forestry consists of Governor-appointed volunteers who oversee Oregon's forest protection laws and regulations. The Forestry Program for Oregon lays out the board's

eight-year vision for Oregon's forests. It also describes how Oregon's private and public forest landowners can work with citizens to ensure that Oregon's forests are managed to balance economic, environmental, and social benefits. This progressive plan addresses important challenges, such as growing populations, the conversion of forests for other uses, and the declining health of federal forests. It establishes **19 indicators** of sustainable forest management that serve as measuring sticks. Established in 1977, the program's most recent eight-year plan was adopted in 2011.

Oregon Department of Forestry Forest Practices Act

The Oregon Forest Practices Act (FPA) sets standards for any commercial activity involving the establishment, management, or harvesting of trees on Oregon's forestlands. The FPA regulates these operations on all non-federal lands (private, state-owned, and county- or city-owned). The broad categories covered in the FPA include planning and conducting forest harvesting operations, road construction and maintenance, fish and wildlife protection, chemical use, and reforestation. Every non-federal landowner in Oregon planning any kind of commercial forest operation is required to file a written notification and site map with the ODF and follow the rules set forth in the FPA.

Oregon Forest Collaboratives

Forest collaboratives have been forming throughout Oregon over the past two decades as part of an increase in community-based organizations working to achieve natural resource management goals to complement the work of public land agencies, like the USFS. There are now 23 collaborative groups in Oregon: 14 are focused on "Dry Forest" landscapes, 9 are focused on "West-side Forests", and there is at least one community-based collaborative group working with each of the 11 National Forests located in Oregon. Collaboratives include a variety of stakeholders from public, tribal, private, and nonprofit organizations, businesses, and engaged citizens. These collaboratives have focused on facilitating the scaling-up of landscape-level agreement, treatment, restoration, and monitoring activities.

Regional and Broad-Scale Multi-State Planning Efforts

Oregon conservation planning has occurred within the context of several multi-state efforts. These plans examine the complex interactions between multiple species and habitats across broad areas, and provide insight for Oregon's Strategy. Although each of these planning efforts has slightly different goals and objectives, they provide a solid basis for natural resources planning in Oregon. These plans were consulted in development of the Strategy and will continue to be referenced, as appropriate, as the Strategy is implemented.

Northwest Forest Plan

Adopted in 1994, the Northwest Forest Plan (NWFP) is an integrated, comprehensive design for ecosystem management, intergovernmental and public collaboration, and rural community economic assistance for federal forests in western Oregon, Washington, and northern California. The intent of the NWFP is to adopt coordinated management direction for the lands administered by the USFS and the

BLM, and to adopt complementary approaches by other federal agencies within the range of the Northern Spotted Owl. The management of these public lands must meet dual needs: the need for forest habitat and the need for forest products. Although focused on the 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 it covers over 1,000 species of plants, animals, and fungi. The NWFP has yet to be fully implemented. For example, the ten federal adaptive management areas established in the Plan to emphasize research on ecosystem function in forested landscapes have not been utilized. Full implementation of the economic, social, and environmental goals of the NWFP is needed to ensure sustainable use of federal forestlands.

TNC's Ecoregional Assessments

TNC's ecoregion planning approach divides the nation into physiographically-similar areas to identify and protect large tracts of land that are characterized by unique natural areas and features. TNC has strategic plans for threatened areas within each ecoregion to protect and maintain biodiversity. The process includes assessment of species and ecosystems within an ecoregion, setting species and habitat goals, designing a network that will meet those goals, and identifying highest priority areas to conserve. TNC then works with partners to establish the conservation network.

Interior Columbia Basin Ecosystem Management Project

The project developed a framework for ecosystem management and a scientific assessment of the ecological, biophysical, social, and economic conditions of the Columbia Basin, including all of eastern Oregon. Instead of a formal, basin-wide decision from the project, federal decision-makers adopted a strategy of incorporating the science into ongoing USFS and BLM land management plans.

Federal Land Management Plans

National Forest Plans (**USFS**) and Resource Management Plans (**BLM**) – These plans provide management direction for the many multiple uses of National Forests, including outdoor recreation, range, timber, watershed, fish and wildlife, minerals, wilderness, roadless areas, and cultural resources. These plans were amended by the NWFP on the westside and the Interior Columbia Basin Strategy on the eastside.

An Ecosystem Approach to Salmonid Conservation

This document provides a natural science-based framework for government agencies and landowners to incorporate an ecosystem approach to habitat conservation planning, protection, and restoration of aquatic habitat on non-federal lands in the Pacific Northwest. It includes guidance for developing, monitoring, and implementing habitat conservation plans in a larger regional context of conservation goals.

Western Governor's Association 10-Year Comprehensive Wildfire Strategy

An advisory committee with experts on forest health policy, including timber industry representatives, state and federal land managers, rural community leaders, and environmental representatives developed a comprehensive, state-of-the-science strategy to best protect communities and the environment from the dangers of catastrophic wildfire.

Northwest Power and Conservation Council

The Northwest Power and Conservation Council is an agency representing Idaho, Montana, Oregon, and Washington. The Council is directed by the Northwest Power Act of 1980 to develop a program to protect, mitigate, and enhance fish and wildlife of the Columbia River Basin affected by hydropower dams. The Council has three primary responsibilities:

- Develop a 20-year electric power plan that will guarantee adequate and reliable energy at the lowest economic and environmental cost to the Northwest.
- Develop a program to protect and rebuild fish and wildlife populations affected by hydropower development in the Columbia River Basin.
- Educate and involve the public in the Council's decision-making processes.

Columbia River Estuary Study Taskforce

The Columbia River Estuary Study Taskforce (CREST) is a council of governments that includes local counties, cities, and port districts surrounding the Columbia River Estuary in both Oregon and Washington. CREST is a non-regulatory, regional organization providing a forum for members to identify and discuss issues of regional importance, to monitor and comment on governmental activities related to the development and management of the natural, economic, and human resources of the Columbia River Estuary, and to improve communication and cooperation between member governments.

CREST provides coastal and estuarine technical services for members, coordinates activities between agencies, and provides information, maps, and educational materials to residents of the region. Examples include permitting issues, zoning ordinance, comprehensive plan and shoreline master plan amendments, estuarine impact analysis, wetlands issues, dredging issues, and water quality issues. CREST developed a 1977 publication, Columbia River Estuary Inventory of Physical, Biological, and Cultural Characteristics, that was used to develop the Columbia River Estuary Regional Management Plan in 1979, which was adopted in the local comprehensive plans in Oregon and shoreline master programs in Washington.

The Columbia Basin Fish and Wildlife Authority

Established by charter in 1987, the Columbia Basin Fish and Wildlife Authority objectives include coordinating the fish and wildlife activities of interagency and tribal concern, facilitating interagency and

tribal involvement in the implementation of the Northwest Power Planning Council's Fish and Wildlife Program, and interacting with the water and land planning and management authorities of the Columbia River Basin. The Authority's members include the four state (Oregon, Washington, Idaho, and Montana) and two federal (USFWS and National Marine Fisheries Service) fish and wildlife management entities and 13 Indian tribes of the Columbia River Basin.

Columbia River Gorge Commission

The Columbia River Gorge Commission was authorized by the 1986 Columbia River Gorge National Scenic Area Act and created through a bi-state compact between Oregon and Washington in 1987. The Commission was established to develop and enforce policies and programs that protect and enhance the scenic, natural, cultural, and recreational resources of the Gorge, while encouraging compatible growth within existing urban areas of the Gorge and allowing economic development outside urban areas consistent with resource protection. The Commission works in partnership with a number of entities to implement a regional Management Plan. Partners include Oregon and Washington; the USFS; four treaty Indian tribes (the Nez Perce, Umatilla, Warm Springs, and Yakima Indian Nations); Clark, Klickitat, and Skamania Counties in Washington; and Hood River, Multnomah, and Wasco Counties in Oregon.

Columbia River Intertribal Fish Commission

The Columbia River Intertribal Fish Commission (CRITFC) is the technical support and coordinating agency for fishery management policies of the four Columbia River treaty tribes. These tribes include: the Confederated Tribes of Warm Springs, the Confederated Tribes and Bands of the Yakima Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe. Membership is composed of the fish and wildlife committees of these tribes. CRITFC, formed in 1977, employs biologists, other scientists, public information specialists, policy analysts, and administrators who work in fisheries research and analysis, advocacy, planning and coordination, harvest control, and law enforcement.

Lower Columbia River Estuary Partnership

The Lower Columbia River Estuary Partnership, one of 28 programs in the National Estuary Program, is a two-state, public-private initiative. Its primary responsibility is to implement the Comprehensive Conservation and Management Plan for the 146 miles of the lower Columbia River and estuary. The Management Plan was developed by bringing together diverse interests to reach consensus on how to protect this complex portion of the Columbia River system. Using a watershed approach, the Estuary Partnership cuts across political boundaries, integrating 28 cities, 9 counties, and the states of Oregon and Washington. The Plan identifies 43 actions to address 7 priority issues (biological integrity, impacts of human activity and growth, habitat loss and modification, conventional pollutants, toxic contaminants in sediments, institutional constraints, and public awareness and stewardship). The actions and issues were derived from scientific studies and input from citizens of the lower Columbia

River and estuary. The Management Plan has no regulatory authority and relies on voluntary participation.

Local and Regional Plans

ODF State Forest Management Plans

ODF manages about 860,000 acres of forestlands. ODF-managed lands are mostly concentrated in six large State Forests:

- Clatsop State Forest
- Elliott State Forest
- Gilchrist State Forest
- Santiam State Forest
- Sun Pass State Forest
- Tillamook State Forest

ODF forest management plans provide management direction for all Board of Forestry Lands and Common School Forest Lands, and are actively managed under adopted forest management plans to provide economic, environmental, and social benefits. These include timber harvest, revenue to local governments and schools, protection of fish and wildlife habitat and other environmental values, and opportunities for recreation and learning.

Oregon Estuary Plan

Compiled by Oregon's Department of Land Conservation and Development, the Oregon Estuary Plan book provides an overview of the values and functions of estuaries and the requirements of Statewide Planning Goal 16 (Estuarine Resources). The purpose of Goal 16 is to maintain the environmental, economic, and social value of estuaries. The Oregon Estuary Plan book describes how cities and counties have addressed Goal 16 requirements in local comprehensive plans and land use ordinances, and how these local requirements are applied during review of individual projects. Because estuaries often have complex ownerships and jurisdictions, the Oregon Estuary Plan book promotes coordinated action by local, state, and federal agencies that have an interest in Oregon's estuaries.

Willamette River Initiative's Willamette Restoration Strategy

With increasing population and development pressures within the Willamette Valley, Governor Kitzhaber appointed a group to address water quality and habitat issues in the basin and adopt a strategy to protect and restore the basin's ecological health. This strategy was developed through a collaborative process involving over 150 partners and participants from businesses, government agencies, tribes, academia, watershed councils, agriculture, forestry, and environmental organizations.

Completed in 2001, the Willamette Restoration Strategy includes plans to protect and restore fish and wildlife habitat and increase populations of declining species within the context of continuing population growth in the basin.

Species Conservation and Management Plans

Many plans have been completed for single species or related groups of species. These plans address needs of threatened or endangered species, game species, and other species of interest.

ODFW Species Conservation and Management Plans

ODFW creates species management plans to guide management of game and other species. Examples include the Big-Horned Sheep and Rocky Mountain Goat Management Plan, Elk Management Plan, Mule Deer Management Plan, and Black Bear Management Plan. In some cases, the plans are interagency, multi-stakeholder efforts, such as the **Oregon Greater Sage-Grouse Conservation Assessment and Strategy**.

ODFW Native Fish Conservation Policy and Stock Status Reports

ODFW is currently reviewing the status of salmonid populations. This review includes production of a Native Fish Status report on each Species Management Unit and population of selected native fish in the state. The review identifies status using four criteria: distribution, abundance, productivity, and reproductive independence.

Oregon Coastal Coho Assessment

This multi-stakeholder effort coordinated by ODFW and National Oceanic and Atmospheric Administration (NOAA) Fisheries examines the status of the Oregon Coast Coho Salmon Evolutionarily Significant Unit. The Coho Assessment will evaluate actions under the Oregon Plan to conserve and rebuild coastal coho populations and develop a conservation plan consistent with state and federal recovery plan guidelines.

Federal Recovery Plans

The USFWS and NOAA Fisheries (also known as the National Marine Fisheries Service) are the two agencies charged with the administration and implementation of the Endangered Species Act. The goal of the Endangered Species Act is the recovery of listed species to levels where protection under the Act is no longer necessary. To meet this goal, Recovery Plans delineate reasonable actions that are believed to be required to recover and protect listed species. Plans are published by the USFWS and NOAA for some species. Plans have been prepared with the assistance of recovery teams, contractors, state and federal agencies, and others.

Individual Species Conservation Assessments Developed by USFS and BLM

Federal agencies have developed detailed species assessments and plans for many species of interest. Although some of these assessments may cover only a small portion of a species' range, the information may be pertinent to one or more of the ecoregions, or to the identified Strategy Habitats within an ecoregion.

Bird Conservation Plans

Many regional and national bird plans have identified conservation priorities for birds. These plans were consulted in determining Strategy Species. Examples include Partners in Flight species scores, Regional Shorebird Conservation Plans, Regional Waterbird Conservation Plans, Oregon-Washington Partners in Flight Bird Conservation Plan focal species, National Audubon "WatchList" status, geographical area-specific bird conservation plans, and American Bird Conservancy State Green Lists.

Eastern Oregon All-Bird Plan

Prepared by the Oregon Habitat Joint Venture, this planning effort reviewed, merged, and synthesized the goals and objectives of existing bird conservation plans into a coordinated planning document that reflects the species and habitat priorities of all bird conservation programs in eastern Oregon.

Other Natural Resource Planning Efforts for Oregon's Ecoregions

Some major planning efforts specific to Oregon's eight terrestrial ecoregions are listed below. This list is not comprehensive but demonstrates some of the local efforts to determine issues and priorities. Linking to local planning and restoration efforts will be an effective way to work toward the Strategy's goals, while providing a greater context and recognition for the efforts of communities.

Blue Mountains

- Wallowa County Nez Perce Tribe Salmon Habitat Recovery Plan – Wallowa County citizens, the Nez Perce Tribe, and agency professionals developed a plan to restore and maintain habitat for Chinook salmon and other salmonid species in Wallowa County.
- Watershed council watershed assessments and action plans
- Sub-basin plans
- Hells Canyon Initiative (multi-state, multi-agency bighorn sheep restoration effort)
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

Coast Range

- Northwest Forest Plan: Addresses management of late-successional forests on federal land. It covers extensive areas of forest in the Coast Range ecoregion.
- ODF State Forest plans: Northwest and Southwest Oregon State Forest Management Plans and Elliot State Forest Management Plan
- Watershed council watershed assessments and action plans
- Sub-basin plans
- Oregon Coastal Coho Assessment: Evaluates status of the Oregon Coast Coho Salmon Evolutionarily Significant Unit. This collaborative project between ODFW and NOAA Fisheries seeks to assess actions under the Oregon Plan to conserve and rebuild coastal coho populations, develop a conservation plan consistent with state and federal recovery plan guidelines, and work with multi-stakeholder teams.
- Comprehensive Conservation and Management Plans, completed for the Columbia River Estuary (by the Lower Columbia River Estuary Program) and Tillamook Bay (by the Tillamook Bay National Estuary Project): Identifies issues, actions, and indicators.
- Lower Columbia and Columbia Estuary Bi-State Sub-basin Plan: Comprehensive and detailed effort to catalogue wildlife and biological dynamics in the Columbia Estuary; extensive database efforts
- Oregon Estuary Plan: Compilation of city and county planning efforts to address critical needs of Oregon's estuaries
- Oregon Parks and Recreation Department Plans: Ocean Shore Management Plan and Habitat Conservation Plan for the Snowy Plover
- Pacific Coast Estuarine Information System: A database developed by the USGS and Environmental Protection Agency (EPA) to catalogue native and invasive estuarine species and sediment, contaminant, and nutrient levels in estuaries of the Pacific Coast.
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

Columbia Plateau

- Watershed council watershed assessments and action plans
- Sub-basin plans
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

East Cascades

- Watershed council watershed assessments and action plans
- Sub-basin plans
- Klamath Basin Ecosystem planning effort: An interagency effort managed by the USFWS to address habitat conservation and water management issues.
- The Upper Klamath Basin Working Group: Chartered by Congress in 1996 to develop a plan for the Upper Basin that focuses on enhancing ecosystem restoration, improving economic stability, and minimizing impacts associated with drought on all resources and stakeholders. The Working Group is comprised of over 30 individuals appointed by the Governor of Oregon, representing federal, state, and local governments and agencies; the Klamath Tribes; conservation organizations; farmers and ranchers; and industry and local businesses. The Working Group completed a restoration plan in 2002.
- ODF State Forest plans (Sun Pass State Forest)
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

Klamath Mountains

- Watershed council watershed assessments and action plans
- Sub-basin plans
- Northwest Forest Plan: Addresses management of late-successional forests on federal land. It covers extensive areas of forest in the western part of the Klamath Mountains ecoregion.
- Oregon Coastal Coho Assessment: Evaluates status of the Oregon Coast Coho Salmon Evolutionarily Significant Unit. This collaborative project between ODFW and NOAA Fisheries seeks to assess actions under the Oregon Plan to conserve and rebuild coastal coho populations, develop a conservation plan consistent with state and federal recovery plan guidelines, and work with multi-stakeholder teams.
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

Northern Basin and Range

- Watershed council watershed assessments and action plans
- Sub-basin plans
- Greater Sage-Grouse Conservation Assessment and Conservation Strategy for Oregon

- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

West Cascades

- Watershed council watershed assessments and action plans
- Sub-basin plans
- Northwest Forest Plan: Addresses management of late-successional forests on federal land. It covers extensive areas of forest in the West Cascades ecoregion.
- ODF State Forest plans (Santiam State Forest)
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

Willamette Valley

- Watershed council watershed assessments and action plans
- Sub-basin plans
- Oregon Coastal Coho Assessment: Evaluates status of the Oregon Coast Coho Salmon Evolutionarily Significant Unit. This collaborative project between ODFW and NOAA Fisheries seeks to assess actions under the Oregon Plan to conserve and rebuild coastal coho populations, develop a conservation plan consistent with state and federal recovery plan guidelines, and work with multi-stakeholder teams.
- The Portland Metropolitan Greenspaces Master Plan: Describes a vision for a unique regional system of parks, natural areas, greenways, and trails for fish, wildlife, and people. Identifies urban natural areas, trails, and greenway corridors for the Portland metropolitan region.
- Willamette Restoration Initiative: 2002 community conference on riverfront issues that discussed ecology, history, tourism, and riverfront revitalization. Identifies priority actions for conservation in lowlands and midlands and emphasized the importance of reconnecting floodplains.
- Willamette River Basin Planning Atlas: Looks at three alternative scenarios of the Basin's future, showing effects of management of urban, rural, and natural lands and waters across the entire basin through the year 2050.
- Local comprehensive land use plans, conservation plans, or assessments developed by local city, county, municipal, or tribal governments

OREGON'S EXISTING REGULATORY FRAMEWORK

This section highlights some of Oregon's regulatory framework. A complete evaluation of the federal regulatory framework is beyond the scope of the Conservation Strategy.

Oregon's Statewide Land Use Planning Program

Oregon's statewide land use planning program originated in 1973 under Senate Bill 100. The foundation of the program is 19 statewide planning goals covering a range of resources and issues, including citizen involvement, protection of farm and forestlands, transportation, public facilities, natural resources and open space, and coastal resources.

The statewide goals are achieved through local comprehensive planning. State law requires each local government to adopt a comprehensive plan that is consistent with the statewide goals, and the implementing ordinances needed to put the plan into effect. The state Land Conservation and Development Commission (LCD) reviews local comprehensive plans and implementing ordinances for consistency with the Statewide Planning Goals. When LCD officially approves a local government's plan, the plan is said to be 'acknowledged'. After acknowledgment, the plan becomes the controlling document for land use in the area covered by that plan. State law recommends local governments go through a periodic review process at specified intervals of time to revise and update plans and ordinances to address new or amended state requirements and changing conditions.

Oregon's planning laws apply not only to local governments, but also to special districts and state agencies. The laws strongly emphasize coordination to keep plans and programs consistent with each other, with the goals, and with acknowledged local plans. Except as provided in ORS 197.277 or 197.180(2) or unless expressly exempted by another statute, ORS 197.180 requires state agencies with programs affecting land use to carry out these programs in compliance with the statewide planning goals and in a manner compatible with local comprehensive plans and land use regulations.

The Oregon Forest Practices Act

Voted into law by the legislature in 1971, the Oregon Forest Practices Act was the first of its kind in the nation. The Act encourages economically efficient forest management in Oregon and the continuous growing and harvesting of trees and maintenance of forestland on privately-owned land consistent with the protection of forest resources through the sound management of soil, air, water, fish, and wildlife resources. It also helps preserve scenic resources along visually sensitive corridors and reduces the risk of serious bodily injury or death caused by shallow, rapidly-moving landslides directly related to forest practices. Under the authority of the Act, the ODF regulates forest operations on nearly 12 million acres of non-federal forestland. It guides forest landowners and operators on how to conduct forest operations and activities so they are in compliance with the FPA administrative rules. These rules apply to harvesting, reforestation, road construction and repair, slash disposal (treetops, branches, brush, and tree limbs left on the ground after a logging operation), chemical use, and stream, lake, and wetland

protection. Sensitive resource sites, such as bird nesting and roosting locations, and threatened and endangered species sites are also protected under the rules. Oregon's forest ecosystems are diverse and dynamic. The ODF provides scientific information for adapting policies, management practices, and restoration activities to better achieve management, protection, and restoration goals. The success of the program reflects the vision created by the 1971 legislature, as well as the tremendous efforts of landowners and stewardship foresters who collaborate on the ground to focus on results, rather than process.

Oregon's Regulatory Streamlining Initiative

Executive Order 03-01 requires state agencies to review their regulations of business activities and their regulatory processes to reduce the burden of regulation on business without compromising Oregon's standards and protections. The Office of Regulatory Streamlining at the Department of Consumer and Business Services was established to facilitate this effort. The Office of Regulatory Streamlining provides ongoing research to identify opportunities for regulatory streamlining and serves as a clearinghouse for agency streamlining efforts.

Oregon State Agencies

- **Oregon Department of Fish and Wildlife** is the state agency with a primary responsibility for conserving the state's living fish and wildlife, with a mission of protecting and enhancing species and habitat. The agency manages fish hatchery programs, sets and enforces angler catch limits and hunting tag limits, develops species conservation plans, establishes fish and wildlife policies, manages wildlife areas, and sponsors landowner conservation incentives programs.
- **Oregon Department of Environmental Quality** (DEQ) regulates water quality by establishing and enforcing state standards for point and non-point pollution for each watershed or sub-basin. DEQ:
 - requires that plans be developed by the appropriate federal, state, or local land management agency for complying with Total Maximum Daily Load limits for each regulated pollutant identified in the watershed.
 - maintains a **nonpoint source program** to manage water pollution from surface runoff. The program works to enhance watershed protection, voluntary stewardship, and stakeholder partnerships. Among other activities, the program provides technical assistance, a cost-share program, stewardship recognition, and education about watershed enhancement projects.
 - has a number of **permits and programs** designed to reduce point or non-point source pollution, including: the Nonpoint Source Program, the National Pollution Discharge Elimination System (NPDES) permit, Water Pollution Control Facilities (WPCF) permit, NPDES Storm Water Discharge permit, Underground Discharge permits, and Sewage Disposal permits.

- **Oregon Department of Forestry** manages forested lands owned by the residents of Oregon and enforces the requirements of the State Forest Management Act on private land. The Forestry Program for Oregon and the Oregon FPA provide the legal and regulatory framework for managing forestlands in Oregon. ODF develops an annual strategic plan and management plans for each State Forest. It also requires plans from landowners harvesting timber on private property, requiring the operation meet a variety of stipulations including riparian buffers, clearcut size, road design and maintenance, and slope stabilization. The mission of the ODF is to serve the people of Oregon by protecting, managing, and promoting stewardship of Oregon's forests to enhance environmental, economic, and community sustainability. Four key department programs work to achieve this mission:
 - The Private and Community Forests Program's mission is to implement progressive policies and programs, including technical assistance, incentives, and regulation that promote healthy sustainable private and community forestlands. Administration of the Oregon FPA and other services to private forest landowners through this program will continue to be important, proven delivery mechanisms for any state wildlife policies affecting these lands.
 - The Protection From Fire Program's mission is to provide a complete and coordinated forestland fire protection system, and in so doing, safely prevent and suppress fire on or threatening forestland within forest protection districts, in a manner which minimizes costs and resource losses.
 - The State Forests Program's mission is to manage Board of Forestry lands to achieve the greatest permanent value (healthy, productive, and sustainable forest ecosystems), and to manage Common School Forest Lands to maximize revenues over the long-term in a manner that is consistent with protecting environmental values. Science-based approaches that include active and integrated resource management techniques will be utilized to ensure that economic, environmental, and social benefits are produced in a sustainable manner.
 - The Forest Resources Planning Program's mission is to lead strategic planning, to provide credible and objective analyses for the Board of Forestry and the ODF, and to actively promote policies that encourage sustainable forest management and further the strategies and actions of the Forestry Program for Oregon on all Oregon forestlands.
- **Oregon Department of Land Conservation and Development** (DLCD) is in charge of Oregon's unique and acclaimed land use planning system. DLCD does not manage land. Instead, it stipulates practices and processes required of local land managers (cities, counties, and Metro Regional Government) to meet 19 goals that cover a broad range of public interests, including conservation of farms and forests, natural resources, open space, estuaries, air and water quality, and the Willamette River Greenway. Cities and counties are required to develop comprehensive plans that address the 19 goals. The goal that most closely addresses fish and

wildlife habitat, Goal 5, requires that cities and counties adhere to a process which requires them to inventory natural resources, determine their significance, identify conflicting uses, and determine whether to allow the conflicting use. Goal 6 provides broad authority to regulate land uses to address water quality. Goal 7 covers areas subject to natural hazards and disasters, including floodplains. Goal 14 has probably had the greatest effect on conserving wildlife habitat by requiring each city or metropolitan area to establish an urban growth boundary that restricts urban development from encroaching on adjacent farms and forests. Goal 15 establishes the Willamette Greenway. Goals 16 (Estuarine Resources), 17 (Coastal Shorelands), and 18 (Beaches and Dunes) regulate development in coastal areas.

- **Oregon Department of State Lands** (DSL) manages state properties as investments to increase state revenues. Its holdings include 784,000 acres of upland property including the Elliott State Forest. DSL also manages the state's submerged public lands and regulates excavation and filling of waterway beds and banks. DSL regulates wetlands permits in Oregon and helps local governments inventory, assess, designate, and develop management plans for wetlands under Oregon's land use Goals 5 (Natural Resources), 16 (Estuaries), and 17 (Coastal Shorelands).
- **Oregon Watershed Enhancement Board** is the state agency that promotes and funds efforts to restore salmon runs, improve water quality, and strengthen aquatic and terrestrial ecosystems to improve conditions of watersheds throughout the state. It is the primary vehicle for funding the activities of watershed councils and provides financial and technical support to SWCDs and other local conservation groups. With OWEB support, many councils have completed watershed assessments and have or are developing watershed action plans. They also provide funding for some capacity building as well as on-the-ground restoration activities. OWEB is building a restoration database and produces progress reports and educational materials.

A number of state agencies do not directly manage species or habitat, but as they manage state lands, infrastructure, or a wide variety of state-run activities, they are required to consider their effects on species and habitat.

- **Oregon Department of Agriculture** is responsible for development of agricultural water quality plans and rules (SB 1010) for each basin in the state. These plans were developed by ODA, working with local stakeholders. The plans include goals, objectives, and recommended practices for agriculture to improve water quality, and the rules require certain conditions to be met.
- **Oregon Parks and Recreation Department** manages publicly-owned properties throughout the state including the Willamette Greenway. While the department's primary emphasis is on recreation, park land management conserves and supports a variety of conservation goals. Each State Park management plan addresses the unique features of the site and identifies specific actions to enhance them. For example, park managers are reintroducing fire at Champoeg State

Heritage Area and Elijah Bristow State Park as a tool for restoring Willamette Valley white oak savannas.

- **Oregon Department of Transportation** shares staff and consults with ODFW regarding the effects of road construction on habitat, particularly fish passage. ODOT is increasingly addressing habitat connectivity and exploring opportunities to incorporate wildlife passage into road and highway plans. A statewide bridge reconstruction project launched in 2002 has served as a means to streamline planning and work in concert with fish and wildlife programs.
- **Oregon Water Resources Department** (OWRD) manages Oregon surface and groundwater. The agency enforces water laws, facilitates voluntary efforts to restore stream flows, and works with watershed groups on water supply issues. Oregon water rights are based on seniority. It is the role of OWRD to determine during drought periods who gets water and who doesn't. On many streams throughout the state, by the end of summer, there is only enough water to supply users who established their rights in the late 1800s. In settings where water rights are over allocated (more rights exist than water in the stream), the OWRD is the arbitrator of competing uses (industries, agriculture, municipalities, or fish and wildlife).

Federal Agencies

Oregon state government is one player among a broad spectrum of organizations engaged in conservation activities. The federal government manages over 34 million acres of publicly-owned land in Oregon, comprising over half of the state. Management of these lands primarily falls under the Departments of Interior and Agriculture. Specific entities within those departments include:

- The USFS manages approximately 17.5 million acres of national forests and grasslands.
- The BLM manages nearly 16 million acres of lands, much of which is interspersed through private property.
- The National Park Service manages almost 200,000 acres, mostly in Crater Lake National Park.
- The USFWS manages an extensive refuge system.

In addition to the federal government's role as land owner, it establishes laws and executive orders that place requirements on states to comply with regulations, most of which require planning, federal and local oversight, monitoring, and reporting.

Additionally, a number of federal agencies provide services that are not primarily focused on fish and wildlife species or habitat management, but are strongly linked through land use. For example, the NRCS primarily provides technical support to agricultural landowners. By virtue of that connection, it provides regional conservation support through its Resource Conservation and Development Program, as well as incentives programs to rural landowners for projects such as wildlife habitat enhancement and fish passage. The USFWS works with private landowners, government agencies, and others to restore and conserve native species and habitats.

Regional Efforts

There also are regional bodies formed to address specific management issues that cross state boundaries. Two of these entities engage in complex planning efforts that affect public and private lands and waterways. The Northwest Power and Conservation Council is charged with developing a plan to guarantee a 20-year supply of reliable and affordable power for the region while protecting and rebuilding fish and wildlife populations affected by power generation activities in the Columbia River Basin. Their most recent major planning endeavor has been development of plans for the 22 sub-basins that make up the Columbia River Basin, with the purpose of focusing resources into highest priority restoration investments.

The Columbia River Gorge National Scenic Area covers 2 states, 6 counties, and 13 cities on both sides of the Columbia River and was formed to protect the scenic, recreational, and natural resource qualities of the Gorge. Commissioners appointed by governors of Washington and Oregon set policy and direct its management under the Gorge Management Plan, which includes stipulations for protection of natural resources, covering wetlands, aquatic habitat, and at-risk wildlife species. Site plans submitted to cities, counties, or the commission are reviewed by respective state wildlife agencies, and where deemed appropriate, wildlife protection plans are required. The 13 urban areas are exempt from these land use provisions.

Local Governments

Oregon's lands include 240 incorporated cities and 36 counties that each must comply with state and federal requirements for wildlife and fish habitat conservation. Each exercises considerable individuality in doing so, based on financial resources, local habitat conditions, and direction from local officials and citizens. All cities and counties have developed local comprehensive plans to address statewide planning goals. Many cities and counties have developed conservation plans to address local conservation issues.

In a number of urbanized areas of the state, cities and counties have formed voluntary councils of government to pool resources and cooperate on issues that cross jurisdictional boundaries. The nature and purpose of these councils is widely varied, reflecting their respective natural and political landscapes. There are nine such councils counting Metro Regional Government, the only such regional body to hold regulatory authority. Several engage in wildlife conservation planning and management activities ranging from open space acquisition to riparian restoration to conservation education. As an example of their capabilities, the Lane Council of Governments has partnered with Eugene and Springfield, TNC, and the BLM to develop a land acquisition plan called Rivers to Ridges, acquiring and restoring the West Eugene Wetlands as native wetlands and wet prairies that also provide urban residents with open space, recreation, stormwater management, and flood control. Another example in the Portland area is the Metro program "Title 3". This is a regulatory program for water quality protection and floodplain management that also addresses vegetation corridors within the urban growth boundary. Also in Portland, the Metro 2040 program is a significant land use planning program

that integrates fish and wildlife habitat protection, concerns about water quality and quantity, and regional growth.

In addition to these local jurisdictions and regional bodies, Oregon has a variety of special districts that deal with aspects of fish and wildlife conservation. SWCDs provide assistance to landowners primarily in rural areas. As part of that service, they assist with habitat conservation planning ranging from stream buffers to fish passage and provide assistance with incentives programs to help fund these projects.

Park districts often pool funding from counties and cities to provide recreational services across jurisdictional boundaries. Many of them restore native vegetation on their sites, partner in planning for public open space, and provide natural resource-based educational activities and interpretation.

In some cases, water treatment agencies contribute significant services in restoring fish and wildlife habitat, restoring water flows to declining streams, and providing educational services. For example, Clean Water Services in Hillsboro shifted its role as a municipal water treatment facility to a ratepayer-funded watershed enhancement agency. In addition to operating four water treatment facilities serving urban Washington County, it developed the Healthy Streams Plan, a coordinated approach for meeting the requirements of the federal Endangered Species Act and Clean Water Act in the Tualatin Basin. The Oregon DEQ issued a Clean Water Act-integrated municipal watershed-based permit for the basin, the first of its kind in the nation, which allows for creative trading between permit holders and landowners in the basin to collectively achieve water quality levels while restoring habitat.

Native American Tribes

Oregon's Native American tribes are recognized as sovereign nations by the federal and state government and are unique legal entities representing distinct communities. There are five groupings of tribes called confederations as well as four independent tribes. Their land holdings within nine reservations vary in size, population, governing structure, and natural resource base.

In 1954, the federal government passed the Termination Act, which severed the trust relationship between the government and many native people with the result that they lost federal tribal recognition and control of their reservation lands. Of the 109 tribes and bands terminated, 62 were native to Oregon. The results were devastating, and it has taken many years for Oregon's tribes to restore the trust relationship and rebuild cultural structure and economic stability, including determining the appropriate use and conservation of natural resources on reservation lands.

Many of the tribes have natural resources staff and get financial and technical assistance through the federal Bureau of Indian Affairs as well as work through partnerships. The reservations are at various stages of planning for and management of natural resources.

Tribe	Trust Restoration	Reservation Size	Enrollment	Ecoregion
Burns Paiute Tribe		13,738	341	Northern Basin and Range
Confederated Tribes of the Grand Ronde	1983	11,040	4,926	Willamette Valley
Coquille Indian Tribe	1989	6,512	819	Coast Range
Confederated Tribes of the Warm Springs Reservation of Oregon		644,000	3,980	East Cascades, Blue Mountains
Confederated Tribes of Siletz Indians of Oregon	1977	4,666	4,094	Coast Range
Confederated Tribes of the Umatilla Indian Reservation		172,882	2,447	Columbia Plateau
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians	1984		754	Klamath Mountains/ West Cascades
Klamath Tribes	1986		3,466	East Cascades
Cow Creek Band of the Umpqua Tribe of Indians	1982	1,289		Klamath Mountains



Photo Credit: Doug Markle, ODFW

GENERAL REFERENCES

The Strategy [Overview](#) section provides the citation format for the Oregon Conservation Strategy.

Throughout the Oregon Conservation Strategy, specific references and key sources of information are provided with each section (for example, [Key Conservation Issues](#), [Strategy Habitats](#), [Strategy Species](#)). General references consulted to update multiple sections of the Strategy are listed in this section below.

GENERAL GUIDANCE DOCUMENTS

- Association of Fish and Wildlife Agencies, Teaming With Wildlife Committee, State Wildlife Action Plan (SWAP) Best Practices Working Group. 2012. Best practices for State Wildlife Action Plans - voluntary guidance to states for revision and implementation. Association of Fish and Wildlife Agencies, Washington, DC.
- Association of Fish and Wildlife Agencies, Teaming With Wildlife Committee, Effectiveness Measures Working Group. 2011. [Measuring the effectiveness of State Wildlife Grants](#). Association of Fish and Wildlife Agencies, Washington, DC.
- Comer, P., D. Faber–Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. [Ecological systems of the United States: a working classification of U.S. terrestrial systems](#). NatureServe, Arlington, VA.
- John Heinz III Center for Science, Economics, and the Environment. 2006. [Filling the gaps: priority data needs and key management challenges for national reporting on ecosystem condition. A report of the Heinz Center’s State of the Nation’s Ecosystems Project](#). John Heinz III Center for Science, Economics, and the Environment, Washington, DC.
- John Heinz III Center for Science, Economics, and the Environment. 2013. Pollinators and the State Wildlife Action Plans: voluntary guidance for state wildlife agencies. Washington, DC. 20 pp.

- Oregon Biodiversity Project: Oregon’s living landscape. 1998. Oregon State University Press.
- U.S. Fish and Wildlife Service, Association of Fish and Wildlife Agencies. 2007. Guidance for Wildlife Action Plan (Comprehensive Wildlife Conservation Strategy) review and revisions. U.S. Fish and Wildlife Service and Association of Fish and Wildlife Agencies, Washington, DC.
- U.S. Fish and Wildlife Service. 2012. [Strategic habitat conservation: Landscape Conservation Cooperatives](#). U.S. Fish and Wildlife Service, Arlington, VA.
- U.S. Fish and Wildlife Service. 2015. Wildlife tracking and reporting on actions for the conservation of species (Version 1.0). <https://tracs.fws.gov>

FISH AND WILDLIFE DOCUMENTS

Where available, key species guidance documents (recovery plans, monitoring plans, etc.) are provided for each individual Strategy Species and found within the [Strategy Species](#). Selected fish and wildlife references consulted by ODFW are listed in this section below. For plants, invertebrates, and nearshore references, see the [Strategy Species Methods](#).

Fish

- ODFW maintains distribution and survey information on many of Oregon’s native fish. For additional information, see the [Corvallis Research Lab](#) and [ODFW Data Clearinghouse](#).
- The ODFW Conservation and Recovery Program has produced several comprehensive conservation planning documents. Sections describe the current status of the populations, key and secondary limiting factors and threats, actions to address the limiting factors, and monitoring and research needs. In the recovery plans, there is also a section describing specific population recovery goals. The guidance documents are available online:
 - [Oregon Coastal coho](#): serves as Oregon’s portion of federal recovery planning.
 - [Rogue spring Chinook](#)
 - [Mid-Columbia steelhead](#): serves as Oregon’s portion of federal recovery planning and includes a discussion of the potential impacts of climate change on particular stream segments throughout the planning area.
 - [Lower Columbia fall Chinook, spring Chinook, chum, coho, winter steelhead, and summer steelhead](#): serves as Oregon’s portion of federal recovery planning and includes some discussion of potential climate impacts.
 - [Upper Willamette spring Chinook and winter steelhead](#): serves as Oregon’s portion of federal recovery planning and includes some discussion of potential climate impacts.
 - [Rogue/South Coast fall Chinook](#)

- [Lower Columbia/coastal white sturgeon](#)
- [Coastal Chinook, spring Chinook, chum, winter steelhead, summer steelhead, and coastal cutthroat trout](#): an extensive discussion on how to prioritize habitat protection and habitat restoration work; incorporates an analysis of species distribution and potential habitat quality for each species to rank basin sections at the HUC 6 level.

Wildlife

General information sources

- [Oregon Biodiversity Information Center](#) stewards observation data and updated taxonomy for plants and animals in Oregon.
- [NatureServe Explorer](#) was consulted for comparative information about species status in adjacent states throughout the species' range.
- [International Union for the Conservation of Nature](#) (IUCN) was consulted for information on species conservation status.
- National Audubon Society [Audubon WatchList](#)
- [The Birds of North America Online](#) (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, NY.
- University of Washington. 2012. [Climate Change Sensitivity Database](#). University of Washington, Seattle, WA.

Selected wildlife species literature consulted for the 2016 Strategy update (additional literature reviews available from ODFW Wildlife Conservation Program)

- Adams, M.J., C.A. Pearl, B. McCreary, S.K. Galvan, S.J. Wessell, W.H. Wente, C.W. Anderson, and A.B. Kuehl. 2009. Short-term effect of cattle exclosures on Columbia spotted frog (*Rana luteiventris*) populations and habitat in northeastern Oregon. *Journal of Herpetology* 43:132-138.
- Adams, M.J., C.A. Pearl, S.K. Galvan, and B. McCreary. 2011. Non-native species impacts on pond occupancy by an anuran. *Journal of Wildlife Management* 75(1):30-35.
- Adamus, P.R., K. Larsen, G. Gilson, and C.R. Miller. 2001. Oregon breeding bird atlas. Oregon Field Ornithology. Eugene, OR (CD-ROM).
- Alkaslassy, E. 2005. Abundance of Plethodontid salamanders in relation to coarse woody debris in a low elevation mixed forest of the western Cascades. *Northwest Science* 79:156-162.
- Altman, B. and J.L. Stephens. 2012. [Land manager's guide to bird habitat and populations in oak ecosystems of the Pacific Northwest](#). American Bird Conservancy and Klamath Bird Observatory. 82 pp.

- Anderson, D.W., D.T. King, and J. Coulson, editors. 2005. The biology and conservation of the American White Pelican. *Waterbirds* 28, Special Publication 1.
- Aubry K.B., S.M. Wisely, C.M. Raley, and S.W. Buskirk. 2004. Zoogeography, spacing patterns, and dispersal in fishers: insights gained from combining field and genetic data. Pages 201-220 in D. J. Harrison and A. K. Fuller, editors. *Martens and fishers (Martes) in human-altered environments: an international perspective*. Springer Science+Business Media, New York, NY.
- Baker, M.D. and M.J. Lacki. 2006. Day-roosting habitat of female long-legged myotis in ponderosa pine forests. *Journal of Wildlife Management* 70:207-215.
- Beck, J.L., K.P. Reese, P. Zager, and P.E. Heekin. 2005. Simultaneous multiple clutches and female breeding success in Mountain Quail. *Condor* 107:889-897.
- Beier, P. and J.E. Drennan. 1997. Forest structure and prey abundance in foraging areas of Northern Goshawks. *Ecological Applications* 7:564-571.
- Bellinger, M.R., S.M. Haig, E.D. Forsman, and T.D. Mullins. 2005. Taxonomic relationships among *Phenacomys* voles as inferred by cytochrome b. *Journal of Mammology* 86:201-210.
- Birt, T.P., H.R. Carter, D.L. Whitworth, A. McDonald, S.H. Newman, F. Gress, E. Palacios, J.S. Koepke, and V.L. Friesen. 2012. Rangewide population genetic structure of Xantus's Murrelet (*Synthliboramphus hypoleucus*). *Auk* 129:44–55.
- Blewett, C.M. and J.M. Marzluff. 2005. Effects of urban sprawl on snags and the abundance and productivity of cavity-nesting birds. *Condor* 107:678-693.
- Bondi, C.A. 2009. A comparison of western pond turtle (*Actinemys marmorata*) movements in perennial and intermittent portions of a northwestern California river system. M.Sc. Thesis. Humboldt State University.
- Bowman, J. and J.F. Robitaille. 2005. An assessment of expert-based marten habitat models used for forest management in Ontario. *Forestry Chronicle* 81:801-807.
- Bowne, D.R., M.A. Bowers, and J.E. Hines. 2006. Connectivity in an agricultural landscape as reflected by interpond movements of a freshwater turtle. *Conservation Biology* 20:780-791.
- Bull, E.L. 2005. Ecology of the Columbia spotted frog in northeastern Oregon. General Technical Report PNW-GTR-640. Pacific Northwest Research Station, Portland, OR.
- Bull, E.L. 2006. Sexual differences in the ecology and habitat selection of western toads (*Bufo boreas*) in northeastern Oregon. *Herpetological Conservation and Biology* 1:27-38.
- Bull, E.L., A.A. Clark, and J.F. Shepherd. 2005. Short-term effects of fuel reduction on Pileated Woodpeckers in northeastern Oregon – a pilot study. Research Paper PNW-RP-564. Pacific Northwest Research Station, Portland, OR.

- Bull, E.L., T.W. Heater, and J.F. Shepherd. 2005. Habitat selection by American marten in northeastern Oregon. *Northwest Science* 79:37-43.
- Burkholder, L.L. and L.V. Diller. 2007. Life history of postmetamorphic coastal tailed frogs (*Ascaphus truei*) in northwestern California. *Journal of Herpetology* 41:251-262.
- Bury, R.B. and D.J. Germano. 2008. *Actinemys marmorata* (Baird and Girard 1852) – western pond turtle, Pacific pond turtle. In Rhodin, A.G.J., P.C.H. Pritchard, P.P. van Dijk, R.A. Saumure, K.A. Buhmann, and J.B. Iverson, editors. *Conservation biology of freshwater turtles and tortoises: a compilation project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group*. Chelonian Research Monographs Number 5.
- Bury, R.B., R. Demmer, and J. Sippel. 2014. [Discovery of Cope's giant salamander east of the Oregon Cascade Range Crest](#). *Northwestern Naturalist* 95:115-119.
- Bury, R.B., H.H. Welsh, Jr., D.J. Germano, and D. Ashston (eds.). 2012. Western pond turtle: sampling techniques, inventory and monitoring, conservation, and management. *Northwest Fauna* 7. Society for Northwestern Vertebrate Biology. 128 pp.
- Chelgren, N.D., C.A. Pearl, M.J. Adams, and J. Bowerman. 2008. Demography and movement in a relocated population of Oregon spotted frogs (*Rana pretiosa*): influence of season and gender. *Copeia* 4:742-751.
- Clayton, D.R., D.H. Olson, and R.S. Nauman. 2005. Conservation assessment for the Siskiyou Mountain salamander. Version 1.4. 32 pp.
- Connelly, J.W. 2010. Habitat needs and protection for Columbian Sharp-tailed Grouse in Washington with emphasis on Okanogan County. Idaho State University, Pocatello, ID.
- Crisafulli, C.M., D.R. Clayton, and D.H. Olson. 2008. Conservation assessment for the Larch Mountain salamander. Version 1.0. 36 pp.
- Cunningham, J.M., A.J.K. Calhoun, and W.E. Glanz. 2007. Pond-breeding amphibian species richness and habitat selection in a beaver-modified landscape. *Journal of Wildlife Management* 71:2517-2526.
- Davies, J.M. and M. Restani. 2006. Survival and movements of juvenile Burrowing Owls during the post-fledging period. *Condor* 108:282-291.
- Davis, A.B. and P.A. Verrell. 2005. Demography and reproductive ecology of the Columbia spotted frog (*Rana luteiventris*) across the Palouse. *Canadian Journal of Zoology* 83:702-711.
- DeGross, D.J., and R.B. Bury. 2007. Science review for the Scott Bar salamander (*Plethodon asupak*) and the Siskiyou Mountains salamander (*P. stormi*): biology, taxonomy, habitat, and detection probabilities/occupancy. Open-File Report 2007-1352. U.S. Geological Survey, Reston, VA.

- Drovetski, D.V., S.F. Pearson, and S. Rohwer. 2005. Streaked Horned Lark *Eremophila alpestris strigata* has distinct mitochondrial DNA. *Conservation Genetics* 6:875-883.
- Dunk, J. and J. Hawley. 2009. Red-tree vole habitat suitability modeling: implications for conservation and management. *Forest Ecology and Management* 258:626–634.
- Dykstra, C.R., J.L. Hays, and S.T. Crocoll. 2008. Red-shouldered Hawk (*Buteo lineatus*). *The Birds of North America Online* (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, NY.
- Fellows, S.D. and S.L. Jones. 2009. Status assessment and conservation action plan for the Long-billed Curlew (*Numenius americanus*). Biological Technical Publication BTP-R6012-2009. U.S. Fish and Wildlife Service, Denver, CO.
- Foster, A.D. and D.H. Olson. 2014. Conservation assessment for the Cope’s giant salamander. Version 1.0. 57 pp.
- Funk, W.C., M.S. Blouin, P.S. Corn, B.A. Maxell, D.S. Pilliod, S. Amish, and F.W. Allendorf. 2005. Population structure of Columbia spotted frogs (*Rana luteiventris*) is strongly affected by the landscape. *Molecular Ecology* 14:483-496.
- Funk, W.C., A.E. Greene, P.S. Corn, and F.W. Allendorf. 2005. High dispersal in a frog species suggests that it is vulnerable to habitat fragmentation. *Biology Letters* 1:13-16.
- Gervais, J.A., C.M. Hunter, and R.G. Anthony. 2006. Interactive effects of prey and p,p'-DDE on Burrowing Owl population dynamics. *Ecological Applications* 16:666-667.
- Gervais, J., D. Rosenberg, S. Barnes, C. Puchy, and E. Stewart. 2009. Conservation assessment of the western painted turtle in Oregon. Version 1.1. 61 pp.
- Hagen, C.A., J.W. Connelly, and M.A. Schroeder. 2007. A meta-analysis of Greater Sage-Grouse *Centrocercus urophasianus* nesting and brood-rearing habitats. *Wildlife Biology* 13:42-50.
- Hansen, M. 2014. Sharp-tailed Grouse flush count results memorandum. Oregon Department of Fish and Wildlife.
- Hayes, M.P., T. Quinn, D.J. Dugger, T.L. Hicks, M.A. Melchior, and D.E. Runde. 2006. Dispersion of coastal tailed frog (*Ascaphus truei*): an hypothesis relating occurrence of frogs in non-fish-bearing headwater basins to their seasonal movements. *Journal of Herpetology* 40:531-543.
- Heady, L.T., and J.W. Laundré. 2005. Habitat use patterns within the home range of pygmy rabbits (*Brachylagus idahoensis*) in southeastern Idaho. *Western North American Naturalist* 65:490-500.
- Howell, B.L. and N.M. Maggiulli. 2011. Conservation assessment for the Cascade torrent salamander. Version 1.0. 50 pp.

- Hossack, B.R., M.J. Adams, C.A. Pearl, K. Wilson, E.L. Bull, K. Lohr, D. Patla, D.S. Pilliod, J. Jones, K. Wheeler, S. McKay, and P.S. Corn. 2013. Roles of patch characteristics, drought frequency, and restoration in driving long-term trends of a widespread amphibian. *Conservation Biology* 27:1410-1420.
- Hossack, B.R., P.S. Corn, and D.B. Fagre. 2006. Divergent patterns of abundance and age-class structure of headwater stream tadpoles in burned and unburned watersheds. *Canadian Journal of Zoology* 84:1482-1488.
- Humple, D.L. and A.L. Holmes. 2006. Effects of a fire on a breeding population of Loggerhead Shrikes in sagebrush steppe habitat. *Journal of Field Ornithologists* 77:21-28.
- Iverson, S.A. and D. Esler. 2006. Site fidelity and the demographic implications of winter movements by a migratory bird, the Harlequin Duck *Histrionicus histrionicus*. *Journal of Avian Biology* 37:219-228.
- Jackson, R.C., D.P. Batzer, S.S. Cross, S.M. Haggerty, and C.A. Sturm. 2007. Headwater streams and timber harvest: channel, macroinvertebrate, and amphibian response and recovery. *Forest Science* 53:356-370.
- Johnson, P.T.J. and R.B. Hartson. 2008. All hosts are not equal: explaining differential patterns of malformations in an amphibian community. *Journal of Animal Ecology* 78:191-201.
- Johnson, G.D. and W. P. Erickson. 2010. Avian, bat, and habitat cumulative impacts associated with wind energy development in the Columbia Plateau ecoregion of Eastern Washington and Oregon. Report prepared for Klickitat County Planning Department. Western Ecosystems Technology, Inc., Cheyenne, WY.
- Jones, S.L., C.S. Nations, S.D. Fellows, and L.L. McDonald. 2008. Breeding abundance and distribution of Long-billed Curlews (*Numenius americanus*) in North America. *Waterbirds* 31:1-14.
- Karraker, N.E., D.S. Pilliod, M.J. Adams, E.L. Bull, P.S. Corn, L.V. Diller, L.A. Dupuis, M.P. Hayes, B.R. Hossack, G.R. Hodgson, E.J. Hyde, K.Lohman, B.R. Norman, L.M. Ollivier, C.A. Pearl, and C.R. Peterson. 2006. Taxonomic variation in oviposition by tailed frogs (*Ascaphus* spp.). *Northwestern Naturalist* 87:87-97.
- Karraker, N.E. and H.H. Welsh, Jr. 2006. Long-term impacts of even-aged timber management on abundance and body condition of terrestrial amphibians in northwestern California. *Biological Conservation* 131:132-140.
- Korfanta, N.M., D.B. McDonald, and T.C. Glenn. 2005. Burrowing Owl (*Athene cunicularia*) population genetics: a comparison of North American forms and migratory habits. *Auk* 122:464-478.

- Kotliar, N.B. 2007. Olive-sided Flycatcher (*Contopus cooperi*): a technical conservation assessment. U.S. Forest Service, Rocky Mountain Region, Fort Collins, CO.
- Krolla, A.J., K. Risenhoover, T. McBride, E. Beach, B.J. Kernohan, J. Light, and J. Bach. 2008. Factors influencing stream occupancy and detection probability parameters of stream-associated amphibians in commercial forests of Oregon and Washington, USA. *Forest Ecology and Management* 255:3726-3735.
- Kutschera, R. 2010. Habitat assessment and conservation recommendations for the western pond turtle and the western painted turtle within the urban growth boundary of Portland, Oregon. Portland State University, Department of Environmental Science and Management. Portland, OR. 77 pp.
- Lehmkuhl, J.F., E.D. Burger, E.K. Drew, J.P. Lindsey, M. Haggard, and K.Z. Woodruff. 2007. Breeding birds in riparian and upland dry forests of the Cascade Range. *Journal of Wildlife Management* 71:2632-2643.
- Linders, M.J., S.D. West, and W.M. Vander Haegen. 2004. Seasonal variability in the use of space by western gray squirrels in southcentral Washington. *Journal of Mammalogy* 85:511-516.
- Marshall, D.B., M.G. Hunter, and A.L. Contreras. 2003. *Birds of Oregon: a general reference*. Oregon State University Press, Corvallis, OR. 752 pp.
- Matson, J.O., W.F. Laudenslayer, Jr., S.A. Trehwitt, and M. Flores. 2010. Range expansion of the western gray squirrel (*Sciurus griseus*) in northeastern California. *Western North American Naturalist* 70:266-269.
- Matsuda, B.M. and J.S. Richardson. 2005. Movement patterns and relative abundance of coastal tailed frogs in clearcuts and mature forest stands. *Canadian Journal of Forest Research* 35:1131-1138.
- McKibbin, R., W.T. Dushenko, G. vanAggelen, and C.A. Bishop. 2008. The influence of water quality on the embryonic survivorship of the Oregon spotted frog (*Rana pretiosa*) in British Columbia, Canada. *Science of the Total Environment* 395:28-40.
- Miller, M.P., M.R. Bellinger, E.D. Forsman, and S.M. Haig. 2006. Effects of historical climate change, habitat connectivity, and vicariance on genetic structure and diversity across the range of the red tree vole (*Phenacomys longicaudus*) in the Pacific Northwestern United States. *Molecular Ecology* 15:145-159.
- Miller, M.P., S.M. Haig, and R.S. Wagner. 2005. Conflicting patterns of genetic structure produced by nuclear and mitochondrial markers in the Oregon slender salamander (*Batrachoseps wrighti*): implications for conservation efforts and species management. *Conservation Genetics* 6:275-287.

- Miller M.P., S.M. Haig, and R.S. Wagner. 2006. Phylogeography and spatial genetic structure of the southern torrent salamander: implications for conservation and management. *Journal of Heredity* 97: 561-570.
- Milburn, P.J. and T.L. Hiller. 2013. Recent kit fox detections at the northern-most extent in southeastern Oregon. *Northwestern Naturalist* 94:150-153.
- Moffatt, K.C., E.E. Crone, K.D. Holl, R.W. Schlorff, and B.A. Garrison. 2005. Importance of hydrologic and landscape heterogeneity for restoring Bank Swallow (*Riparia riparia*) colonies along the Sacramento River, California. *Restoration Ecology* 13:391-402.
- Morse, J.A., A.N. Powell, and M.D. Tetreau. 2006. Productivity of Black Oystercatchers: effects of recreational disturbance in a national park. *Condor* 108:623-633.
- Naughton, M.B., D.S. Pitkin, R.W. Lowe, K.J. So, and C.S. Strong. 2007. Catalog of Oregon seabird colonies. Biological Technical Publication FWS/BTP-R1009-2007. U.S. Fish and Wildlife Service, Region 1, Washington, DC.
- Ober, H.K. and J.P. Hayes. 2008. Prey selection by bats in forests of western Oregon. *Journal of Mammalogy* 89:89-98.
- Ober, H.K. and J.P. Hayes. 2008. Influence of vegetation on use of riparian areas by bats at multiple spatial scales. *Journal of Wildlife Management* 72:396-404.
- Olson, D.H. and J.I. Burton. 2014. Near-term effects of repeated thinning with riparian buffers on headwater stream vertebrates and habitats in Oregon, USA. *Forests* 5:2703-2729.
- Olson, D.H. and M.R. Kluber. 2014. Plethodontid salamander distributions in managed forest headwaters in western Oregon, USA. *Herpetological Conservation and Biology* 9:76-96.
- Olson, D.H., J.B. Leirness, P.G. Cunningham, and E.A. Steel. 2014. Riparian buffers and forest thinning: effects on headwater vertebrates 10 years after thinning. *Forest Ecology and Management* 321:81–93.
- Olson, D.H. and G. Weaver. 2007. Vertebrate assemblages associated with headwater hydrology in western Oregon managed forests. *Forest Science* 53:343–355.
- Olson, D.H. and C. Rugger. 2007. Preliminary study of the effects of headwater riparian reserves with upslope thinning on stream habitats and amphibians in western Oregon. *Forest Science* 53:331-342.
- Olson, D.H. 2011. Conservation assessment for the Rocky Mountain tailed frog in Oregon and Washington. Version 1.0. 33 pp.
- Oregon Department of Fish and Wildlife. [Re-introducing Columbian Sharp-tailed Grouse.](#)

- Oregon Department of Fish and Wildlife. 2014. Kit fox research 2013-15: interim performance report to the U.S. Fish and Wildlife Service for the Pittman-Robertson Wildlife Restoration Grant Number F13AF00838.
- Pearl, C.A., S.K. Galvan, M.J. Adams, and B. McCreary. 2010. Columbia spotted frog (*Rana luteiventris*) in southeastern Oregon – a survey of historical localities, 2009. Open-File Report 2010-1235. U.S. Geological Survey, Reston, VA.
- Pearl, C.A., M.J. Adams, and N. Leuthold. 2009. Breeding habitat and local population size of the Oregon spotted frog (*Rana pretiosa*) in Oregon, USA. *Northwestern Naturalist* 90:136-147.
- Pearl, C.A., M.J. Adams, and W.H. Wentz. 2007. Characteristics of Columbia spotted frog (*Rana luteiventris*) oviposition sites in northeastern Oregon, USA. *Western North American Naturalist* 67:86-91.
- Pearl, C.A., and J. Bowerman. 2006. Observations of rapid colonization of constructed ponds by western toads (*Bufo boreas*) in Oregon, USA. *Western North American Naturalist* 66:397-401.
- Pearl, C.A., M.J. Adams, N. Leuthold, and R.B. Bury. 2005. Amphibian occurrence and aquatic invaders in a changing landscape: implications for wetland mitigation in the Willamette Valley, Oregon. *Wetlands* 25:76-88.
- Pearl, C.A., J. Bowerman, and D. Knight. 2005. Feeding behavior and aquatic habitat use by Oregon spotted frogs (*Rana pretiosa*) in central Oregon. *Northwestern Naturalist* 86:36-38.
- Petrisko, J.E., C.A. Pearl, D.S. Pilliod, P.P. Sheridan, C.F. Williams, C.R. Peterson, and R.B. Bury. 2008. *Saprolegniaceae* identified on amphibian eggs throughout the Pacific Northwest, USA, by internal transcribed spacer sequences and phylogenetic analysis. *Mycologia* 100:171-180.
- Picco, A.M. and J.P. Collins. 2008. Amphibian commerce as a likely source of pathogen pollution. *Conservation Biology* 22:1582–1589.
- Porter, A.D., C.C. St Clair, and A. De Vries. 2005. Fine-scale selection by marten during winter in a young deciduous forest. *Canadian Journal of Forest Research* 35:901-909.
- Rachlow, J.L., D.M. Sanchez, and W.A. Estes-Zumpf. 2005. Natal burrows and nests of free-ranging pygmy rabbits (*Brachylagus idahoensis*). *Western North American Naturalist* 65:136-139.
- Rancourt, S.J., M.I. Rule, and M.A. O’Connell. 2005. Maternity roost site selection of long-eared myotis, *Myotis evotis*. *Journal of Mammalogy* 86:77-84.
- Roberson, A.M., D.E. Andersen, and P.L. Kennedy. 2005. Do breeding phase and detection distance influence the effective area surveyed for Northern Goshawks? *Journal of Wildlife Management* 69:1240-1250.

- Rodhouse, T.J., K.M. Irvine, R.L. Sheley, B.S. Smith, S. Hoh, D.M. Esposito, and R. Mata-Gonzalez. 2014. [Predicting foundation bunchgrass species abundances: model-assisted decision-making in protected-area sagebrush steppe.](#) *Ecosphere* 5:108.
- Rodhouse, T.J., M.F. McCafrey, and R.G. Wright. 2005. Distribution, foraging behavior, and capture results of the spotted bat (*Euderma maculatum*) in central Oregon. *Western North American Naturalist* 65:215-222.
- Rombough, C.J. and M.P. Hayes. 2005. Novel aspects of oviposition site preparation by foothill yellow-legged frogs (*Rana boylei*). *Northwestern Naturalist* 86:157-160.
- Rosenberg, D. and J. Gervais. 2012. Conservation plan for native turtles in the Columbia Slough. Portland, Oregon. 126 pp.
- Rundio, D.E. and D.H. Olson. 2007. Influence of headwater site conditions and riparian buffers on terrestrial salamander response to forest thinning. *Forest Science* 53:320-330.
- Russell, R.E., V.A. Saab, and J.G. Dudley. 2007. Habitat-suitability models for cavity-nesting birds in a postfire landscape. *Journal of Wildlife Management* 71:2600-2611.
- Russell, K.R., T.J. Mabee, M.B. Cole, and M.J. Rochelle. 2005. Evaluating biotic and abiotic influences on torrent salamanders in managed forests of western Oregon. *Wildlife Society Bulletin* 33:1413-1424.
- Ryan, M.E., W.J. Palen, M.J. Adams, and R.M. Rochefort. 2014. Amphibians in the climate vice: loss and restoration of resilience of montane wetland ecosystems in the western U.S. *Frontiers in Ecology and the Environment* 12:232–240.
- Scherer, R.D., E. Muths, B.R. Noon, and P.S. Corn. 2005. An evaluation of weather and disease as causes of decline in two populations of boreal toads. *Ecological Applications* 6:2150-2160.
- Shoo, L.P., D.H. Olson, S.K. McMenamin, K.A. Murray, M. Van Sluys, M.A. Donnelly, D. Stratford, J. Terhivo, A. Merino-Viteri, S.M. Herbert, P.J. Bishop, P.S. Corn, L. Dovey, R.A. Griffiths, K. Lowe, M. Mahoney, H. McCallum, J.D. Shuker, C. Simpkins, L.F. Skerratt, S.E. Williams, and J.M. Hero. 2011. Engineering a future for amphibians under climate change. *Journal of Applied Ecology* 48:487-492.
- Spear, S.F., C.R. Peterson, M.D. Matocq, and A. Storfer. 2005. Landscape genetics of the blotched tiger salamander (*Ambystoma tigrinum melanostictum*). *Molecular Ecology* 14:2553-2564.
- Spear, S.F. and A. Storfer. 2008. Landscape genetic structure of coastal tailed frogs (*Ascaphus truei*) in protected vs. managed forests. *Molecular Ecology* 17:4642-4656.
- Spinks, P.Q. and H.B. Shaffer. 2005. Range-wide molecular analysis of the western pond turtle (*Emys marmorata*): cryptic variation, isolation by distance, and their conservation implications. *Molecular Ecology* 14:2047-2064.

- Stanley, T.R. and S.K. Skagen. 2007. Estimating the breeding population of Long-billed Curlew in the United States. *Journal of Wildlife Management* 71:2556-2564.
- Stoddard, M.A. and J.P. Hayes. 2005. The influence of forest management on headwater stream amphibians at multiple spatial scales. *Ecological Applications* 15:811-823.
- Sutter, B. and G. Ritchison. 2005. Effects of grazing on vegetation structure, prey availability, and reproductive success of Grasshopper Sparrows. *Journal of Field Ornithology* 76:345-351.
- Tait, C.K. and L.V. Diller. 2006. Life history of the southern torrent salamander (*Rhyachotriton variegatus*) in coastal northern California. *Journal of Herpetology* 40:43-54.
- U.S. Fish and Wildlife Service. 2013. Endangered and threatened wildlife and plants. Review of native species that are candidates for listing as endangered or threatened. Annual Notice of Findings on Resubmitted Petitions. Annual Description of Progress on Listing Actions. Proposed Rule Federal Register Vol. 78, No. 226:70119.
- Verts, B.J. and L.N. Carraway. 1998. Land mammals of Oregon. OSU Press, Corvallis, OR. 668 pp.
- Wagner, R.S., M.P. Miller, C.M. Crisafulli, and S.M. Haig. 2005. Geographic variation, genetic structure, and conservation unit designation in the Larch Mountain salamander (*Plethodon larselli*). *Canadian Journal of Zoology* 83:396-406.
- Wahbe, T.R., C. Ritland, F.L. Bunnell, and K. Ritland. 2005. Population genetic structure of tailed frogs (*Ascaphus truei*) in clearcut and old-growth stream habitats in south coastal British Columbia. *Canadian Journal of Zoology* 83:1460-1468.
- Walter, S.T. and C.C. Maguire. 2005. Snags, cavity-nesting birds, and silvicultural treatments in western Oregon. *Journal of Wildlife Management* 69:1578-1591.
- Welsh, H.H., J.R. Dunk, and W.J. Zielinski. 2006. Developing and applying habitat models using forest inventory data: an example using a terrestrial salamander. *Journal of Wildlife Management* 70:671-681.
- Welsch, H.H., Jr., H. Stauffer, D.R. Clayton, and L.M. Ollivier. 2007. Strategies for modeling habitat relationships of uncommon species: an example using the Siskiyou Mountains salamander (*Plethodon stormi*). *Northwest Science* 81:15-36.
- Wheeler, C.A., N.E. Karraker, H.H. Welsh, Jr., and L.M. Ollivier. 2007. Diet of the Del Norte salamander (*Plethodon elongatus*): differences by age, gender, and season. *Northwestern Naturalist* 88:85-94.
- Yost, A.C., S.L. Petersen, M. Gregg, and R. Miller. 2008. Predictive modeling and mapping sage grouse (*Centrocercus urophasianus*) nesting habitat using Maximum Entropy and a long-term dataset from Southern Oregon. *Ecological Informatics* 3:375-386.

- Zielinski, W.J., C. Carroll, and J.R. Dunk. 2006. Using landscape suitability models to reconcile conservation planning for two key forest predators. *Biological Conservation* 133:409-430.
- Zielinski, W.J., R.L. Truex, J.R. Dunk, and T. Gaman. 2006. Using forest inventory data to assess fisher resting habitat suitability in California. *Ecological Applications* 16:1010-1025.