



**Joint Venture  
Implementation Plans  
for Eastern Oregon**

# **Oregon Closed Basin**

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# Joint Venture Implementation Plans for Eastern Oregon

## Introduction

A Joint Venture is a means of developing partnerships among willing and interested private and public individuals, groups, and agencies to achieve common goals of restoration, conservation, and protection of natural habitat values. All stakeholders in wetland and habitat issues are encouraged to join together to facilitate conservation in this collaborative effort. Partners in Joint Ventures work together to combine resources and find innovative ways to meet these goals.

The plans in this document are administered by the Oregon Wetlands Joint Venture (OWJV). This state-level organization serves as the implementation arm for two larger, regional joint ventures -- the Pacific Coast Joint Venture and the Intermountain West Joint Venture -- formed to implement the North American Waterfowl Management Plan. The plans in this document set forth habitat conservation strategies for the eastern Oregon portion of the Intermountain West Joint Venture. The Intermountain West Joint Venture encompasses habitats between the Rocky Mountains and the Sierra Nevada and Cascade mountains. In eastern Oregon, five areas have been identified for planning purposes (Figure 1). These include the Oregon Closed Basin, Klamath Basin, Blue Mountains, Deschutes Basin, and Snake River areas. Detailed descriptions of each area are included in individual Implementation Plans contained in this binder.

Information about the Intermountain West Joint Venture is available from: ***Intermountain West Joint Venture, 145 East 1300 South #404, Salt Lake City, Utah 84115.*** Information about Oregon Wetlands Joint Venture can be found on a web page at: <http://wetlands.dfw.state.or.us> or by writing to: ***Oregon Wetlands Joint Venture, 1637 Laurel Street, Lake Oswego, OR 97034-4755.***

The Oregon Wetlands Joint Venture's mission is to "promote protection, restoration and enhancement of wetlands and the systems on which they depend." The organization plays a statewide leadership role in encouraging and supporting efforts to conserve habitats through voluntary, cooperative means. The Joint Venture functions as a facilitator and coordinator, assisting public and private partners in accomplishing activities that support the organization's mission. Partners retain their individual roles, responsibilities and decision-making authority.

## Oregon Wetlands Joint Venture Goals

- Provide an organizational framework at the state level for voluntary, cooperative efforts to conserve wetland habitats. Link to local, regional and continental habitat conservation initiatives.
- Use planning processes to identify habitat conservation needs and opportunities statewide and assess priorities at multiple levels (state, ecoregion, watershed).
- Develop financial and public support for specific projects and wetland conservation in general.
- Help establish partnerships to implement habitat conservation projects.
- Enhance communication and information sharing among Joint Venture partners.
- Expand public awareness and understanding of wetland values and conservation needs.

The intent of the joint venture includes maintaining biological diversity by providing quality habitats which will serve the needs of many native plant and animal species and prevent the need for future listings under the Endangered Species Act. Joint Venture projects can provide a wide range of benefits, including enhancement of wildlife and fisheries, watershed and water quality improvements, and other habitat values. Project priorities will be primarily be driven by opportunities; opportunities created by the various partners.

## **A Working Document**

This document is intended to be a dynamic document, amended as necessary to accommodate new initiatives and opportunities; hence the binder format. Since conservation is a process, not a one-time event, this document will evolve as some goals are achieved and new ones are conceived.

## **Funding**

Funding for Joint Venture projects comes from a wide variety of sources, including Joint Venture partners, federal and state programs, and private organizations. Some potential funding sources and contact information are summarized in Appendix 1 (not yet complete).

## **Objectives and Strategies**

This plan is intended to address multiple objectives and strategies related to conservation of wetlands and related habitats with the areas targeted for action by Joint Venture partners. The North American Waterfowl Management Plan, the 1986 international agreement that provided the original impetus for joint ventures' wetland habitat conservation efforts, included goals to restore and maintain the diversity, abundance, and distribution of waterfowl that occurred during the 1970s. Over the years, the North American plan has evolved to encompass broader goals that include benefits for other wetlands-dependent wildlife, hydrology and water quality. The 1998 update of the plan encouraged partners to expand that focus to include collaboration with other bird conservation efforts as well, and in 1999, the Intermountain West Joint Venture formally adopted an "all bird" approach as part of its mission.

In Oregon, the Oregon Wetlands Joint Venture has retained its focus on wetlands and related riparian and aquatic habitats. Because of this focus on habitats, and the landscape-scale approach typically used to frame options for potential projects, Joint Venture conservation strategies are broad enough to support a variety of goals and objectives.

Waterfowl goals will continue to be an important emphasis for the Joint Venture in Oregon. The Intermountain West Joint Venture Implementation Plan (Appendix 2) provides numerical goals for waterfowl. Step-down waterfowl objectives for Oregon, when developed, will also be included in Appendix 2.

Efforts are currently underway to develop a North American Bird Conservation Initiative. This endeavor would produce a national conservation plan which will address all birds. It will coordinate the efforts for waterfowl in the North American Waterfowl plan with three other bird initiatives: Partners in Flight, U.S. Shorebird Conservation Plan, and the North American Colonial Waterbird Conservation Plan. Partners in Flight is an international group, dedicated to conservation of migratory landbirds. The U.S. Shorebird Conservation Plan and the North American Colonial Waterbird Conservation Plan are being developed on a national scale to restore and conserve shorebird and colonial waterbird populations. These plans are in various stages of completion, and when finished, will provide goals for these other bird groups which can be delivered by the Joint Ventures. Regional plans developed from these initiatives will provide specific habitat objectives which will be adopted by the Joint Venture. These regional plans and their specific habitat objectives will be included in Appendix 2, as they become available. Appropriate habitat objectives from Pacific Flyway Management Plans will also be adopted by the Joint Venture and these will be summarized in Appendix 2.

The Oregon Wetlands Joint Venture will also assist in addressing goals and objectives from other relevant habitat initiatives which are consistent with the Joint Venture purposes. These will include

watershed health goals and objectives developed by the Oregon Department of Environmental Quality, Oregon Watershed Enhancement Board and local Watershed Councils. The Joint Venture will also support habitat initiatives for recovery of state and federal listed or sensitive species and goals to enhance habitat for native fishes, including improving fish passage and screening facilities.

# **OREGON CLOSED BASIN: WETLANDS IMPLEMENTATION PLAN**

## **1. Introduction**

The Oregon Closed Basin has been identified as a distinct geographic region within the Joint Venture for planning purposes. This plan will focus on the wetland habitats and associated resources in this region. Other habitat goals and strategies will be incorporated at a later time. This plan will identify potential projects and inspire partnerships to achieve mutual goals and increase benefits derived from wetland systems.

The Oregon Closed Basin covers the Oregon portion of the Northern Great Basin, and includes portions of Lake, Harney, Malheur, and Grant counties (Figure 1). This is an area of over 6 million acres, dominated by dry upland habitats, and including about 500,000 acres of wetlands, including rivers and streams. This northern cold desert is characterized by low precipitation and wetlands in the region are subject to feast-and-famine water regimes. Wetland basins are internally drained and contain very diverse wetland types which are very important production and migration areas for Pacific Flyway waterfowl, shorebirds and marsh and riparian birds, and they also provide habitat for endemic fishes, amphibians, and other native fauna and flora. Closed Basin wetlands are an oasis in an otherwise forbidding landscape. They store water, capture nutrients, and produce a wide array of plants and invertebrates. As a result, these wetlands often support spectacular concentrations of birds, especially during migration. These wetlands also contribute to local economies by providing tourism, recreation, water storage and livestock forage.

Although the Closed Basin covers about 18 percent of Oregon, it is home to less than one percent of the state's population. Less than 15,000 people live within its bounds, or slightly less than one person per square mile. The only urban communities within the area are Burns and Hines in northern Harney County and Lakeview in southern Lake County. The economy of the region is based on ranching, farming, tourism, and forest products manufacturing. The region is a popular area for hunting and wildlife viewing, and eco-tourism is increasing as an economic factor.

## **2. Fish and Wildlife Resources of Concern**

Major wetlands in this region are very important as migrational staging areas for Pacific Flyway waterfowl. At least 40 percent of Pacific Flyway snow geese and Ross' geese stage at Summer Lake and the Harney Basin in spring. Larger wetland complexes in the area provide migrational staging areas for tundra swans, Canada geese, Pacific greater white-fronted geese (including tule geese), lesser snow geese (including Russia's Wrangel Island and Western Canadian Arctic snow geese), Ross' geese, northern pintails, American wigeon, green-winged teal, mallards, gadwalls, canvasbacks, redheads and other diving ducks. Peaks of over 2,000,000 ducks and geese utilize the region's wetlands during migration. Larger wetland complexes provide habitat for tens of thousands of breeding waterfowl, including large numbers of Canada geese, cinnamon teal, redheads, gadwall, and mallards; and significant populations of other ducks, including northern pintails and canvasbacks. A small population of trumpeter swans also breed in the area.

The area's waterbird population is even more diverse, supporting some of the largest breeding colonies in Oregon, including the only breeding area in Oregon for Franklin's gulls (Littlefield and Thompson 1981). Other breeding colonial nesting birds include: American white pelican, double-crested cormorant, great blue heron great egret, snowy egret, cattle egret, black-crowned night heron,

white-faced ibis, Caspian tern, ring-billed gull and California gull. Greater sandhill cranes nest in substantial numbers throughout the area and about 20,000 lesser sandhill cranes stage in irrigated private hay meadows during spring migration. Other breeding waterbirds include western, Clark's, eared, horned and pied-billed grebes; American and least bitterns; sora, Virginia and yellow rails; American coot; and Forster's, Caspian and black terns.

Numerous shorebird species, including breeding western snowy plovers, use habitat in the Summer Lake, Lake Abert, Harney, and Alvord basins. Other breeding shorebirds include killdeer, black-necked stilt, American avocet, willet, spotted sandpiper, long-billed curlew, common snipe, and Wilson's phalarope. Species staging during spring and fall migration include semipalmated plover, greater and lesser yellowlegs, western and least sandpipers, long-billed dowitcher, and red-necked phalarope.

Birds use the wetlands in the Closed Basin as stepping stones during migration. This community of wetlands meet the requisites of a wide variety of birds, providing food, rest and cover for nesting and migration. Individual birds may visit and use most of these major wetlands in the area at some stage of their life cycle. Conserving the quality and connectivity of wetlands in this region is very important to maintaining healthy populations of wetland birds (Haig et al. 1998).

Stream-side riparian habitats provide shade, cover and insect foods for fish and wildlife and can help improve water quality. These habitats meet the needs of well over half of the area's migratory landbirds, including species such as yellow warbler, willow flycatcher, and black-headed grosbeak. Providing more connectivity to these habitats will help conserve landbird populations.

Wetlands, rivers and creeks also provide habitat for native fishes, amphibians and a great variety of other native flora and fauna. Native fishes of the area vary among the basins which once contained large pluvial lakes. Listed fishes include the Warner sucker, Foskett Springs dace, Hutton Springs dace, Summer Basin tui chub, XL Spring chub, and Borax Lake chub. Redband trout have been petitioned for federal listing (Fish and Wildlife Service 1998). Wetlands and streams also support a wide variety of other native suckers, whitefish, chubs, dace, shiners, northern pikeminnow, roach, and sculpin. Native fish often face competition from introduced game fish and other exotic species. Also, the Oregon spotted frog is a candidate for federal listing and is found in drainages on Steens Mountain, Malheur NWR and other streams and wetlands.

### **3. Existing Habitat Protection**

Some of the most important wetland habitats in the Closed Basin have been accorded formal protection by federal or state agencies. The largest block is found within Malheur National Wildlife Refuge in the Harney Basin, which includes about 110,000 acres of wetlands. Another 12,300 acres of wetlands are within the bounds of Hart Mountain National Antelope Refuge. The Oregon Department of Fish and Wildlife's Summer Lake Wildlife Management Area contains 18,700 acres of managed emergent marshes, seasonal wetlands and associated uplands. The Bureau of Land Management has established a number of special management areas, including the 51,000-acre Warner Wetlands (19,000 acres of wetlands), and Lake Abert (more than 40,000 acres of the lake and associated wetlands), both designated as "Areas of Critical Environmental Concern" and research natural areas at Foster Flat (2,000 acres) and Tumtum Lake (1,520 acres). The Nature Conservancy maintains preserves at Borax Lake (320 acres) and on the eastern edge of Crump Lake (700 acres). In addition, as of 1999 about 1,000 acres of private lands have been enrolled in the U.S. Department of Agriculture's Wetlands Reserve Program and are subject to permanent conservation easements and an additional 4,000 acres are under application for easements.

### **4. Challenges to Address**

Historic wetland losses have not been specifically quantified for this region, however, Dahl (1990) reported 38 percent wetland loss in Oregon since the 1780s. The most significant change in wetlands in the Closed Basin was the loss of woody riparian vegetation along streams, rivers and floodplains due to historic overgrazing by livestock. An estimated 70-90 percent of all natural riparian areas in the United States have been extensively altered (Hirsch and Segelquist 1978). The hydrology of most of the region's wetlands has been altered by irrigation diversions and in some cases by diking and drainage. Rivers and creeks have often been dammed to divert flows for irrigation and channelized to convert permanent wetlands to seasonal wetlands suitable for producing livestock forage. Issues relating to wetland restoration in the Great Basin are summarized by Engilis and Reid (1997).

In this region, the practice of flood irrigation combined with haying and grazing provides very important habitat for spring staging waterfowl, sandhill cranes and shorebirds; especially in Harney, Chewaucan and Goose Lake basins. These practices should be sustained, as they provide early spring foods needed by migratory birds for migration and nesting.

A major problem facing breeding waterfowl and other waterbirds in the area is the scarcity of summer water which reduces survival of young. Private landowners typically dewater their wetlands in mid June and begin cutting hay in late June. This practice causes young birds to move long distances to water and increases their vulnerability to predators. Also, the actual cutting of hay often kills young birds which remain in the meadows. Developing educational information and incentives for private landowners to use more compatible practices would reduce these problems. Restoration of wetland basins and development of impoundments with manageable water sources and secure water rights on public and private lands would greatly enhance waterfowl and other waterbird production. In some areas, upland nesting cover for waterfowl is limited by land use practices. Provision of incentives for management of nesting cover on private lands should also be explored.

In the Harney Basin, the introduction of exotic carp severely reduced wetland quality, limiting waterfowl use and production (Ivey et al. 1998). Development of facilities and strategies to minimize the impacts of carp on native fauna should be pursued to improve aquatic habitats for waterfowl and native fishes.

Many streams have been degraded by overgrazing and water diversions and lack adequate fish protection or passage, limiting habitat availability and quality for native fish. A total of 90 streams within the region are on Oregon Department of Environmental Quality's (DEQ) list of water quality limited streams, primarily because they are not cool enough to meet temperature standards (DEQ 1998). Woody riparian habitat is very limited along streams in the region. Projects should be developed on private and public lands to improve stream habitat conditions including providing fish passage and screening, improving woody riparian vegetation and increasing shade, restoring natural hydrology, and improving water quality. These actions will improve habitat conditions for a variety of native flora and fauna including native fishes and riparian landbirds.

Invasions of exotic weeds are a problem in many wetland basins. These weeds often replace vast areas of native plant communities with negative impacts to native flora and fauna. Reed canarygrass forms dense monotypic stands that essentially exclude wildlife and limit biological diversity. Perennial pepperweed grows in seasonal wetlands and associated uplands and also replaces native plant communities. Russian olive trees have invaded a few riparian areas and have potential to replace native trees and shrubs. Tamarisk, a very invasive shrub which displaces native riparian vegetation, has also appeared in eastern Oregon and should be exterminated before it becomes a problem. Partnerships which address problem weeds on public and private lands should be pursued.

During the 1980s in the Harney Basin, flooding of Malheur Lake damaged private land values on over 80,000 acres. A similar wet cycle appears to be beginning and flooding is again returning to these lands. These areas include wetlands important to wildlife. Solutions such as easements or acquisition

of flooded lands could lead to improved wetland habitats in the future, and should be explored to help landowners recover losses and to maintain wetland values.

## 5. Important Habitats

Six major wetland complexes encompass the most significant wetland habitats in the Focus Area. These complexes (which include the riparian habitats along their tributary streams) include: 1) the Harney Basin; 2) the Summer, Abert, and Silver Lake basins; 3) Warner Basin; 4) Goose Lake Basin; and 5) Catlow, Pueblo, and Alvord basins and 6) the scattered desert playa wetlands, which extend from Guano Valley northwest to Christmas Valley.

Most of these areas have been extensively modified by human activities and particularly by irrigation diversions for hay production and livestock grazing. Flood irrigation is still widely used and provides extensive seasonal wildlife habitat on private lands, as do the associated storage impoundments and distribution systems.

Each of the Closed Basin's major wetland complexes includes a myriad of smaller wetlands which provide substantial habitat during wet weather regimes. These range from small and relatively permanent forested wetlands to extensive assemblages of playa lakes that are only wet during wetter than normal years. The hydrology and vegetation of small playa wetlands has been changed by waterhole construction and resultant livestock grazing concentrations. With some exceptions, the amount and quality of the habitats available at these smaller wetlands may be more a function of annual precipitation than any human factor. The region also includes a number of other wetland complexes which historically provided important habitat for native fish and wildlife. These areas are predominantly in private ownership and have been significantly altered by diversions of water for irrigation and draining of wetlands for agricultural use. Montane wetlands such as those on Steens Mountain have been impacted primarily by livestock grazing. Habitat values are primarily seasonal and vary dramatically depending on climate and water levels.

## 6. Habitat Objectives

This plan will incorporate compatible habitat goals and objectives from companion initiatives such as Partners in Flight, national shorebird and colonial waterbird plans, Pacific Flyway plans, recovery plans for listed species, Oregon Department of Fish and Wildlife plans, including the Oregon Wildlife Diversity Plan, Oregon Department of Environmental Quality, Oregon Watershed Enhancement Board, local Watershed Councils and others as appropriate. Summaries of these companion initiatives are presented in Appendix 2. Planning for some of these initiatives is not yet complete and these will be added when they become available.

The following are broad wetland goals to work towards in the Closed Basin:

### Habitat Objectives

1. Ensure long-term protection for at least 50 percent of the Closed Basin's wetland and riparian habitats. Use conservation easements, cooperative agreements, and partnerships or acquisition where appropriate to achieve this objective.
2. Secure adequate water, including adequate quality, quantity, and timing, for existing wetlands.
3. Restore 40,000 acres of wetlands; enhance 12,000 acres of wetlands and 200 miles of riparian habitat, using partnerships with willing landowners, agencies, and groups.

## 7. Target Areas and Strategies for Implementation

Target Areas are important wetland complexes which could be improved through Joint Venture partnerships. This section describes existing wetland values and possible projects at important wetland sites in the Closed Basin. These projects may be achieved through various combinations of projects and partners. Proposals are more likely to succeed and receive funding if they affect large areas, achieve multiple objectives and include a variety of partners. The following descriptions of Target Area projects are formulated to be achieved over the next 10 years. Table 1 summarizes current habitat objectives for important Target Areas. The Target Area descriptions are intended to be updated periodically as new information is developed and old objectives are achieved or new ones are conceived.

Table 1. Wetland habitat objectives for important Target Areas for the Oregon Closed Basin.

| <b>Target Area</b>            | <b>Protect</b>      | <b>Restore</b>      | <b>Enhance</b>      |
|-------------------------------|---------------------|---------------------|---------------------|
| Alvord Basin                  | 1,120 acres         | 500 acres           | 0                   |
| Catlow Basin                  | 1,000 acres         | 1000 acres          | 0                   |
| Chewaucan Basin               | 3,000 acres         | 3,000 acres         | 0                   |
| Desert Playas and Springs     | 0                   | 1,000 acres         | 10 acres            |
| Goose Lake Basin              | 13,000              | 8,000               | 0                   |
| Guano Basin                   | 0                   | 100 acres           | 100 acres           |
| Harney Basin private lands    | 10,000 acres        | 10,000 acres        | 0                   |
| Lake Abert                    | 1,500 acres         | 500 acres           | 100 acres           |
| Malheur Refuge                | 5,000 acres         | 1,100 acres         | 3,250 acres         |
| Silvies and Bear Valleys      | 3,750               | 3,750               | 0                   |
| Silver Creek Basin (Lake Co.) | 3,000 acres         | 3,000 acres         | 0                   |
| Summer Lake Basin             | 1,500 acres         | 1,765 acres         | 6,600 acres         |
| Warner Valley                 | 7,000 acres         | 8,000 acres         | 2,000               |
| <b>TOTAL</b>                  | <b>49,870 acres</b> | <b>41,715 acres</b> | <b>12,060 acres</b> |

### Definitions: Protect, restore, enhance

**Protection** includes fee title acquisition from landowners willing to sell, exchange, or donate land. It also includes protection through long-term easements, conservation covenants, leases, management agreements, and other mechanisms. Lands are considered protected when they are controlled by agencies or owners that have demonstrated a long-term commitment to preserving the land's wildlife values.

**Restoration** is the process of altering a damaged or former wetland to produce a wetland with ecological relationships and characteristics that represent the site's natural hydrology, structure, function, diversity, and dynamics. Restoration of wetlands can be as simple as plugging a field drain or reflooding a converted wetland or as complex as reconfiguring a historic stream channel to restore a natural floodplain.

**Enhancement** (not always easily distinguished from restoration) involves increasing the carrying capacity of habitat or selected habitat values within an existing wetland. This can be accomplished by means such as water management, managed fires, control of exotic species, and other practices. Enhancement efforts will not be undertaken at the expense of healthy functioning natural wetlands.

## Alvord Basin

Located on the east side of Steens Mountain, the Alvord Basin is an 80 mile-long drainage containing a series of lakes and numerous springs and seeps. Most of the wetland ownership is private or BLM. At the north end of this system, **Ten Cent, Fifteen Cent, Tudor and Juniper lakes** provide habitat for nesting and migrating waterfowl during wet years. **Borax Lake**, a small wetland fed by hot spring water, is owned by The Nature Conservancy and is managed for Borax Lake chub, a federally-listed threatened species, but also supports a variety of shorebird species. **Alvord Lake** is a large playa, of sand dunes, extensive alkali flats and shallow water during wet periods. A few snowy plovers breed around Borax and Alvord Lakes. At the north end of Alvord Basin, a large private marsh supports nesting waterfowl, cranes and shorebirds. This area should be a priority for a conservation easement. **Mann Lake** supports hatchery Lahontan cutthroat trout, introduced by ODFW. There is a nice marsh at the south end of Mann Lake, worthy of conservation. **Alvord Slough** which flows from Borax Lake to Alvord Lake, supports a small population of Alvord chub, another sensitive species. At the south end of the Basin, **Tum Tum Lake** is a 475-acre lake designated as a Research Natural Area. It is fed by **Pueblo Slough** which also contains wetlands that support nesting waterfowl and shorebirds.

### Recommended Actions:

- Protect and restore at least 1,000 acres of wetland habitats on private lands through Wetland Reserve Program, conservation easements, and cooperative efforts with land owners.
- Acquire 120 acres of land along the shore of Mann Lake for BLM.

## Catlow Basin

Catlow Valley harbors an abundance of diverse wetland habitats that support migrating and breeding waterfowl as well as several sensitive species, including breeding sandhill cranes, Catlow redband trout, and Catlow tui chub. Perennial water is provided by Rock Creek, flowing east from Hart Mountain, and from Home, Three-mile and Skull creeks. Three-mile Reservoir supports nesting waterfowl and shorebirds and in wet years, western grebes. Rock Creek Reservoir supports limited waterfowl nesting. Both of these sites are used by redband trout. Extensive wet meadows and seasonal lakes such as the Garrison lakes provide spring habitat for migrating and nesting waterfowl and sandhill cranes. There are opportunities to construct additional permanent impoundments to enhance habitat for redband trout and waterfowl. BLM manages the **North Catlow Wetlands**, a small wetland area (200 acres) on the north end of the valley, for migrating waterfowl. The Roaring Springs Ranch's owners have a conservation agreement with state and federal agencies for redband trout and have cooperated with BLM and Ducks Unlimited to enhance wetlands. Opportunities exist for restoration of additional wetlands.

### Recommended Actions:

- Support Roaring Springs Ranch's efforts regarding the Conservation Agreement for redband trout and Catlow watershed restoration in enhancement of 25 miles of stream habitat.
- Protect and restore at least 1,000 acres of wetland habitats on private lands through Wetland Reserve Program, conservation easements and cooperative efforts with land owners. Explore options for constructing additional permanent impoundments on Roaring Springs Ranch to enhance habitat for redband trout and waterfowl.

- Explore options for enhancing 20 miles of stream habitat in Rock Creek for redband trout on private, BLM and USFWS ownership.

## Chewaucan Basin

The Chewaucan River drains into **Upper and Lower Chewaucan Marshes** near Paisley and terminates in *Lake Abert*. The privately-owned Chewaucan marshes contain about 30,000 acres that have been developed into flood-irrigated wet meadow habitats, providing very important spring staging habitat for tule white-fronted geese and Wrangle Island Population snow geese. These areas support very high densities of nesting ducks and sandhill cranes and have supported nesting colonies of white-faced ibises, and great and snowy egrets in recent years. The **Rivers End Project** is a large historic wetland system along the lower reaches of the Chewaucan River above Lake Abert which was enhanced and restored through a partnership with a private land owner in the mid-1990s. This area provides excellent migrational staging habitat as well as supporting colonies of double-crested cormorants, great and snowy egrets, and black-crowned night-herons.

### Recommended Actions:

- Protect and restore at least 3,000 acres of wetland habitats on private lands through Wetland Reserve Program, conservation easements, and cooperative efforts with land owners. Protect ibis colony sites on Chewaucan Marshes through acquisition, easement or other cooperative efforts with land owners. Maintain sump areas for late summer brood water.
- Enhance at least 25 miles of stream along the Chewaucan River and its tributaries through restoration of riparian habitats and installation of adequate fish passage and screening facilities by working with landowners through incentives and cooperative programs.

## Desert Playas and Springs

Playas are a unique component of the Closed Basin's wetland systems, providing a connecting link to larger wetland sites through many small islands of habitat scattered throughout the landscape. These highly seasonal wetlands are widely distributed across the area, with concentrations in the Alvord and Guano basins, south and west of Harney Lake, and in northern Lake County.

Depending on water conditions, playas can provide high quality spring migration habitat for waterbirds, and in some cases, summer-long water on playa lakebeds. Many of these habitats have been degraded by livestock grazing and development of water sources for livestock. Additional research and monitoring is needed to better understand the historic and current function and distribution of these habitats, but opportunities for restoration should be pursued. BLM's Foster Flat Research Natural Area/Area of Critical Environmental Concern is a 2,000-acre playa lakebed west of Jack Mountain that maintains water year-long in wet cycles. The area has been excluded from livestock grazing and may provide some insight into the values and functions of Great Basin playas.

Small spring systems, some of which support rare fish species, are particularly vulnerable to impacts from livestock use. Many have been degraded by grazing, and some have been tapped or partially diverted to watering troughs. For some species, even minor manipulation of these springs can lead to habitat loss and extinction (U.S. Fish and Wildlife Service 1997).

### Recommended Actions:

- Reconstruct the west dike at Seiloff Spring to enhance 10 acres of wetlands.
- At Foster Flat, monitor changes in vegetation and length of time water is present on the playa to evaluate effects of livestock exclusion. Continue monitoring all playa habitats under management to determine vegetation changes.
- Support research designed to identify management actions to maintain or improve vegetative quality and the hydrology of playa lakebeds and help describe the importance of playas to wildlife. Reverse dugouts to provide experiment for modified playa rehabilitation. Modify livestock grazing strategies and practices to protect springs and portions of playas from degradation.
- Restore 1,000 acres of playa wetlands.

## Goose Lake Basin

Bisected by the Oregon-California border, **Goose Lake** and the adjacent private wetlands to the north support substantial production of Canada geese, ducks and sandhill cranes, and are important to migrating waterfowl. In addition, Goose Lake is one of the most important breeding areas for Clark's grebes in North America, with an estimated population of 1,000 birds (Ratti 1992). Over 10,000 American avocets have been recorded staging at Goose Lake (Warnock *et al.* 1998). It is also a major migration staging area for tundra swans, and has supported wintering populations of over 10,000 Canada geese. Most of the area's wetlands have been converted or modified for agricultural use. Wetlands and riparian systems provide key habitat for Goose Lake redband trout and a number of other native fish species.

The last hardstem bulrush marsh in Goose Lake valley is found on the Garrett Ranch north of Goose Lake. This 10,000-acre ranch has been proposed for acquisition as a new National Wildlife Refuge. In recent years, nesting white-faced ibises have used this site and it also supports nesting sandhill cranes and shorebirds as well as a diversity of waterfowl. Peaks of over 30,000 waterfowl have been recorded on the property. Thomas Creek, which runs through the property, is a key stream for Goose Lake redband trout.

### Recommended Actions:

- Support acquisition of Garrett Ranch property (10,000 acres) as a new National Wildlife Refuge. Restore 5,000 wetland acres. If this isn't possible, pursue easements or other cooperative efforts with the landowner to preserve wetlands and protect the site of the white-faced ibis colony.
- Protect and restore at least 3,000 acres of additional wetland habitats on private lands through Wetland Reserve Program, conservation easements and cooperative efforts with land owners.
- Enhance at least 2 miles of Thomas Creek through restoration of riparian habitats and installation of adequate fish passage and screening facilities.

## Guano Basin

Located on Guano Creek south of Hart Mountain Refuge, the historic **Shirk Ranch** homestead contains an emergent marsh and meadow complex that provides significant habitat for migrating and

breeding waterfowl and other waterbirds. BLM plans for the area emphasize habitat for migratory birds, with active management of grazing to enhance wetland diversity and wildlife values.

#### Recommended actions:

- Restore 100 wetland acres and enhance 100 wetland access to improve habitat for migratory birds.
- Manage livestock grazing program (season of use and utilization) to enhance values for migratory birds.
- Improve riparian habitat conditions along 10 miles of Guano Creek.

## Harney Basin

The **Silvies River Floodplain** is located north of Malheur Refuge and drains into Malheur Lake. The floodplain is comprised of over 100,000 acres of seasonal wetlands in private ownership. The **Warm Springs Valley, Diamond Valley, Happy Valley and Barton Lake Valley** are smaller, privately-owned floodplains in the Basin. The wetlands in these valleys are maintained by surface irrigation and managed for native hay production and cattle grazing. These practices create high quality habitats for migratory birds, providing habitat for hundreds of thousands of geese, ducks, cranes, and other waterbirds in the spring, particularly in wet years. Spring peaks of over 300,000 snow geese and Ross' geese, 120,000 ducks, and over 12,000 sandhill cranes have been counted on the Silvies Floodplain. These valleys are important habitats for breeding sandhill cranes, waterfowl and shorebirds as well. A study conducted from 1975-1981 details numbers of waterbirds using the Harney Basin (Paullin et al. 1977, Horton et al. 1983, Littlefield 1983).

During wet years, these floodplains could potentially produce substantial numbers of waterfowl. Studies conducted by the Fish and Wildlife Service during the late 1970s showed about 15,000 ducks produced from the Silvies Floodplain during wet years, and only about 1,500 ducks produced during dry years (Littlefield 1983). The biggest problem for wetland birds nesting on the floodplain is a shortage of summer brood water. Ranchers begin drying their meadows in early June to allow mower access for haying in late June. Mallard broods are about half grown at this time and most gadwall nests are unhatched. The remaining water available for broods is often limited to the Silvies River channels and a few deep ditches. Because of their depth and the presence of carp, these areas are poor brooding sites. Waterfowl and waterbird production on the floodplain could be enhanced by construction of large impoundments to provide brooding habitat. Provision of landowner incentives to delay dewatering and hay harvest would also lead to increased bird production. Other considerations for wetland birds in hayed wetlands are described by Ivey (1996).

Historically, these valleys supported extensive riparian areas along numerous braided stream channels. Restoration of woody riparian habitat would help improve water quality and enhance conditions for landbirds and native fishes.

Flooding of Malheur Lake has inundated private lands in the area during extreme wet years. Solutions to alleviate the hardship caused to landowners should include alternatives for wetland protection, restoration and enhancement.

#### Recommended Actions:

- Protect and restore at least 10,000 acres of wetland habitats through Wetland Reserve Program, conservation easements and cooperative efforts with private land owners.

- Work with private landowners to maintain flood irrigation practices to conserve wetland habitat and develop locally coordinated habitat management guidelines for landowners to enhance wildlife production and use on private lands.
- Enhance at least 25 miles of stream in the Silvies River and its tributaries through restoration of riparian habitats and installation of adequate fish passage and screening facilities by working with landowners through incentives and cooperative programs.

## Lake Abert

**Lake Abert** is owned and administered by BLM, which has designated approximately 49,900 acres of the lake, shoreline, and surrounding habitats as an Area of Critical Environmental Concern. It is the largest saline lake in the Pacific Northwest, covering approximately 55 square miles at high water levels. The lake's large populations of brine shrimp and brine flies make it an attractive resting and foraging area for waterfowl and shorebirds. Shoreline habitats of alkali playads, mudflats, and sand and gravel beaches have supported over 150,000 shorebirds (Jehl 1988). Peaks of over 30,000 American avocets (Nehls 1994) and 150,000 phalaropes have been counted during surveys (Jehl 1988). Lake Abert is especially important to Wilson's phalaropes, American avocets and eared grebes as well as other species of grebes, gulls, and northern shovelers. Total waterbird/waterfowl use is estimated at more than 3.25 million bird-use days (Bureau of Land Management 1995). Peak numbers occur from mid-July to mid-September. Lake Abert also has a breeding population of snowy plovers, a sensitive species, with a total of 298 adults counted there in 1990 (Stern et al. 1991). The lake has also been proposed as a Western Hemisphere Shorebird Reserve Network site. Development of sodium mineral resources and commercial harvests of brine shrimp could pose threats to the lake's natural values.

BLM plans call for fencing of an additional 6-7 miles of the lake's western shore to exclude livestock grazing. The shorebird plan for the Intermountain Region recommends increasing the amount of freshwater wetland habitat adjacent to Abert Lake to enhance the area for shorebird production (Oring and Neel 1999). This action would also benefit waterfowl and other waterbirds.

### Recommended Actions:

- Implement BLM management plan for Lake Abert.
- Protect 1,500 acres, restore 500 acres and enhance 100 acres of shoreline and other wetland habitats on private lands through easements and cooperative efforts with land owners. Explore options for increasing the amount of freshwater wetlands on the north end of Lake Abert.
- Explore options for protecting Lake Abert from threatening commercial uses.
- Support designation as a Western Hemisphere Shorebird Reserve site.

## Malheur National Wildlife Refuge

This refuge of international significance for Pacific Flyway bird populations encompasses 186,000 acres of lakes, marshes, wet meadows, and upland habitats. It was classified as a *Globally Important Bird Area* in 1999. **Malheur Lake** is the largest freshwater marsh west of the Mississippi that has not been significantly altered hydrologically by humans. **Harney Lake** is an alkaline, hypersaline lake providing unique habitats. Both lakes have completely dried up on several occasions in this century

but expanded to cover 180,000 acres in the early 1980s. The floodplain wetlands of the **Blitzen Valley** and the **Double O Unit** have been intensively modified with constructed impoundments, canals, dikes and water control structures that allow manipulation of water to create desirable wetland habitats for waterfowl, shorebirds and sandhill cranes.

Three major bird migration routes converge at Malheur Lake. Estimates of total numbers of birds moving through the area ranged from 1.8 million to 3.6 million birds in the 1970s (Littlefield 1990). Refuge habitats are heavily used by waterfowl and waterbirds during spring and fall migration and provide breeding habitat for a wide variety of species, ranging from ducks, geese, swans and sandhill cranes to shorebirds, colonial waterbirds and songbirds. Malheur supports some of the highest duck nesting densities in the state and also a small population of breeding trumpeter swans. The refuge supports the largest numbers of breeding sandhill cranes under any single ownership in the state (Littlefield *et al.* 1994). Large breeding colonies of white-faced ibises (over 12,000 pairs), egrets, herons, cormorants, American white pelicans, gulls and terns are also present. Also, these wetland sites support high numbers of breeding shorebirds and annual migrant shorebird counts have exceeded 50,000 individuals (unpublished data, Malheur Refuge). Harney and Stinking Lake both support breeding snowy plovers, with a peak of over 400 adults counted on the refuge (Hermann *et al.* 1988). A study conducted from 1975-1981 details numbers of waterbirds using Malheur Refuge (Paullin *et al.* 1977, Horton *et al.* 1983, Littlefield 1983). The ecology of Malheur Lake is described by Duebbert (1969).

The southern end of the Blitzen Valley supports some of the highest nesting densities of willow flycatchers ever documented (J. Sedgwick, pers. comm.). Bobolinks, an Oregon sensitive species, depend on wet meadows for breeding habitat, and the largest bobolink colony west of the Great Plains uses the native hay meadows of the upper Blitzen Valley (Wittenberger 1978). The Refuge also supports redband trout and Oregon spotted frogs as well as a great diversity of other native fauna.

Exotic carp are widespread in the Harney Basin and severely degrade wetland habitats. At Malheur Refuge, carp have been recognized as a serious problem, limiting waterfowl production and use since their invasion into Malheur Lake about 1950. Before carp invaded the refuge, duck production averaged over 111,000 ducks annually in the 1940s, and peaked at 147,000 ducks in 1948. After the carp population became established, duck production has averaged less than 30,000 annually. It is very important to for the refuge to continue to reduce the impacts of carp on native fish and wildlife (Ivey *et al.* 1998).

Another problem facing Malheur Refuge waterfowl is the shortage of late-season brood water. The Blitzen Valley Plan prescribed creation of over 1,000 acres of additional brood ponds (Rule *et al.* 1990). The Double-0 Plan (David *et al.* 1995) prescribes enhancing wetlands for waterfowl by restoring drainage for better carp management.

Flooding in the Blitzen Valley in recent years has resulted in losses of up to 80 percent of nests for waterfowl and other ground-nesting birds. A Refuge planning release in August 1996 announced plans to initiate restoration of the Blitzen River and its tributaries to enhance conditions for redband trout and reestablish woody riparian vegetation for landbirds and other wildlife. It also acknowledged the need to improve fish passage and screening facilities at irrigation structures throughout the Blitzen River system. Restoration of a more natural floodplain for the Blitzen River would alleviate flooding problems and provide improved habitat for many native species.

Invasive exotic weeds such as perennial pepperweed are a major problem at Malheur. This particular species has replaced entire native plant communities in some portions of the refuge. Actions need to be taken to control this pest to preserve the native diversity on the refuge.

#### Recommended Actions:

- Improve water delivery system to enhance efficiency and flexibility of irrigation and wetland management strategies.
- Protect at least an additional 10,000 acres through acquisition of lands from willing sellers.
- Improve passage and screening facilities to enhance the Blitzen River and tributaries for redband trout and other native fish.
- Use fishways, traps, and screens to limit carp migration into the Blitzen River and Double O Unit to enhance productivity of wetlands and other aquatic habitats.
- Enhance 30 miles of instream and associated riparian habitat in the Blitzen River and tributaries for redband trout and other native fish and wildlife. Improve 40 miles of Blitzen River and Bridge Creek channels to restore more natural hydrology and improve water quality.
- Improve water management capability in 1,100 wetland acres of Double O Unit to allow better wetland management and carp control. Improve water management facilities to allow better management of carp populations, which will enhance existing wetlands.
- Enhance wetlands by improving brood ponds to reduce predation on breeding waterfowl and waterbirds.
- Control invasive exotic plants on 30,000-40,000 acres and develop strategies to prevent future introductions

## Silver Creek Basin (Lake County)

Silver Creek feeds **Thompson Valley Reservoir** which provides some waterfowl habitat within the bounds of Fremont National Forest. Near the town of Silver Lake, Silver Creek drains into **Paulina Marsh**, and terminates in **Silver Lake**, two sites which historically supported extensive wetland systems. Most inflows are now diverted for irrigation, and habitat values are limited except during wet cycles. Paulina Marsh is privately owned, and contains flood-irrigated wetlands supporting nesting waterfowl and sandhill cranes. A pair of trumpeter swans has successfully nested in this area in recent years. Silver Lake contains about 6,000 acres of wet meadow and marsh vegetation, fed primarily by Silver Creek. Water levels in Silver Lake vary greatly between years and it is often dry. It fills during extreme wet years to cover about 9,000 acres. When water levels are adequate, Silver Lake supports nesting and migrating waterfowl. Silver Lake and Paulina Marsh have both supported mixed colonies of white-faced ibises, and snowy and great egrets during recent wet periods.

### Recommended Action:

- Protect and restore at least 3,000 acres of wetland habitats through Wetland Reserve Program, conservation easements and cooperative efforts with private land owners. The ibis colony sites should be priorities for conservation.
- Work with private landowners to maintain flood irrigation practices to conserve wetland habitat and develop locally coordinated habitat management guidelines for landowners to enhance wildlife production and use on private lands.

- Enhance at least 5 miles of Silver Creek through restoration of riparian habitats and installation of adequate fish passage and screening facilities by working with landowners through incentives and cooperative programs.

## Silvies and Bear Valleys

Water from the Silvies River and its tributaries floods the lower portions of the **Silvies Valley** in the spring, creating excellent habitat for migrating waterfowl, waterbirds, and shorebirds. A variety of waterfowl and waterbirds nest there, including sandhill cranes. Fall waterfowl use is limited due to lack of water. The majority of the valley's wetlands are in private ownership, but a land exchange between BLM and private landowners in 1997 blocked up public ownership of 690 acres of floodplain wetlands with excellent habitat potential.

Wet meadows in **Bear Valley** provide breeding habitat for a variety of waterfowl and waterbirds and influence downstream flows and water quality throughout the Silvies River system. More than 30,000 acres of the valley floor are dominated by wetlands in a mosaic of wet meadows interspersed with grass and sagebrush steppe. The majority of Bear Valley is in private ownership and is managed for livestock forage. The valley is an important nesting area for sandhill cranes, and is one of the few places in the state supporting breeding upland sandpipers, a sensitive species. This species has been affected by habitat modifications from heavy livestock grazing and cutting of snags and perching trees at nesting sites (Marshall et al. 1992).

### Recommended Actions:

- Maintain existing habitat values on BLM ownerships, particularly in wet meadow habitats. Opportunities for wetland enhancement should be evaluated to ensure that existing wetland habitats are not eliminated or degraded.
- Acquire easements or fee title to restore about 750 acres of private lands to facilitate enhancement of BLM wetland sites in Silvies Valley.
- Protect and restore at least 3,000 acres of wetland habitats through Wetland Reserve Program, conservation easements and cooperative efforts with private land owners.
- Develop locally coordinated habitat management guidelines for private landowners and agencies to enhance wildlife production and use.

## Summer Lake Basin

**Summer Lake** is a 40-square mile hypersaline lake with adjacent freshwater marshes and springs and extensive alkali flats along the shore. It is among the state's most important areas for migratory birds. The lake's size may vary by 25 percent seasonally, and it occasionally dries up in periods of drought. A hypersaline-alkaline lake with adjacent freshwater marshes and ponds and extensive alkali flats along the shore, Summer Lake supports upwards of 100,000 shorebirds during migration, primarily in the fall. Large numbers of snowy plovers also nest in the area. The lake's size may vary by 25% seasonally, and occasionally dries up in periods of drought conditions (WHSRN report). **Summer Lake Wildlife Area**, which is located at the north end of Summer Lake, is owned and administered by Oregon Department of Fish and Wildlife. It is managed to provide a public hunting area for waterfowl and upland game, and to provide habitat for breeding and migrating waterfowl and waterbirds. It

encompasses 18,677 acres, much of it covered by a very shallow, managed alkaline and freshwater marsh interspersed with alkali-dominated uplands and playas. An abundance of wetland dependent wildlife is attracted to the area, including almost 260 species of birds and large populations of staging and breeding waterfowl and shorebirds. Summer Lake Wildlife Area is particularly important as a staging area for Wrangel Island snow geese and tule white-fronted geese. Over half the world's population of tule geese stage at Summer Lake each September. Total use by migratory waterfowl has exceeded 5 million use-days for ducks and 4 million use-days for white geese (Oregon Department of Fish and Wildlife 1993). Peaks of white geese have exceeded 75,000 in the fall and 100,000 in the spring and peaks of over 100,000 ducks have been recorded. The Wildlife Area supports breeding populations of up to 20,000 ducks and 400 Canada geese.

Total shorebird use is estimated at up to 1 million use-days, with peak numbers of over 100,000 shorebirds documented during migration in late summer. Peaks of over 50,000 American avocets have been recorded at Summer Lake (Nehls 1994). Snowy plovers nest around Summer Lake and on the Wildlife Area; Stern et al. (1991) counted a peak of 230 adults in 1990. The Wildlife Area also supports colonies of American white pelicans, double-crested cormorants, black-crowned night-herons, egrets, white-faced ibises, Caspian terns, and ring-billed and California gulls.

Development of additional water control capabilities on the Wildlife Area would expand options for enhancement of habitat for target species. The Department's plans also call for expansion of the Wildlife Area as opportunities arise to purchase lands from willing sellers. Most of the western side of the lake is in private ownership; shoreline habitats have been degraded by excessive livestock grazing in some areas.

Bureau of Land Management also administers lands in the Basin, and has designated its lands on the east side of Summer Lake as an Area of Critical Environmental Concern. BLM's habitat management plan for the Rosebud/Edmunds Well calls for restoration and enhancement of wetlands (Bureau of Land Management 1993).

#### Recommended Actions:

- Enhance at least 6,000 wetland acres on state land for the benefit of a diverse array of wetland dependent wildlife species by rehabilitating the water delivery system, river dike maintenance and other rehabilitation and improvement of existing water delivery system.
- Protect and restore at least 1,000 wetland acres on private lands through Wetland Reserve Program, conservation easements and cooperative efforts with land owners.
- Acquire and restore 500 acres of lands from willing sellers that complement the state wildlife area.
- Support designation of Summer Lake and Summer Lake Wildlife Area as a Western Hemisphere Shorebird Reserve site.
- For BLM's Rosebud/Edmunds Well wetlands, enhance 600 acres, restore 265 acres and manage wetland communities for a diverse native plant community.

## **Warner Basin**

The Warner Basin contains more than 90,000 acres of shallow lakes, marshes and playa wetlands scattered along the 50-mile length of the Warner Valley and is among the most important wetland areas in the state. The Basin is host to a variety of bird species, particularly colonial waterbirds,

including nesting American white pelicans and double-crested cormorants at Pelican Lake (Stern 1988), colonies of white-faced ibises (Ivey et al. 1988), and a variety of gulls, terns, egrets, herons, grebes and other waterbirds (Stern 1988). The Basin supports substantial populations of breeding ducks and geese and has wintered up to 15,000 Canada geese. This area is home to four endemic fishes, including the threatened Warner sucker. Many of the Basin's wetlands have been impacted by human development. More than 50,000 acres of the valley bottom, much of it formerly wetlands, are in crops or irrigated hay pastures. At the north end of the valley, BLM has designated the **Warner Wetlands**, a 51,000-acre Area of Critical Environmental Concern managed primarily for wetland habitat values. About 2,500 acres of BLM-owned wetlands adjacent to Hart Lake were restored in 1988 and are actively managed to provide habitat for breeding birds.

The southern half of the basin has more varied land ownership, particularly around Crump and Pelican lakes where private and state ownership dominates. The Twentymile and Honey creek systems provide critical habitat for populations of the threatened Warner sucker, which in spring migrate from the valley to upstream spawning areas through a checkerboard of different land management and ownerships (U.S. Fish and Wildlife Service 1997). Pelicans and double-crested cormorants nest on an island in Crump Lake.

#### Recommended Actions:

- Acquire, on a willing seller basis, at least 2,000 wetland acres of private lands to be added to BLM's Warner Wetlands Project. Restore 3,000 wetland acres on the project and enhance an additional 2,000 acres.
- Work with Division of State Lands to protect 4,000 wetland acres and restore 2,000 acres on state lands in the valley, particularly areas around Crump Lake.
- Protect and restore at least 3,000 acres of wetland habitats through Wetland Reserve Program, conservation easements and cooperative efforts with private land owners, particularly in the south Warner Valley.
- Enhance at least 5 miles of fish spawning and passage habitat in the Twentymile and Honey creek drainages through restoration of riparian habitats and installation of adequate fish passage and screening facilities by working with landowners through incentives and cooperative programs.

## **Rivers and Streams**

Rivers and streams are found throughout the planning area and provide water to wetlands and habitat for native fishes, amphibians and a diverse array of flora and fauna. Larger rivers in the region include the Silvies, Chewaucan and Blitzen. There are hundreds of miles of smaller streams and tributaries throughout the region. Ninety streams are on DEQ's water quality limited list. Woody riparian habitats along stream systems provide shade, food, and cover for fish and wildlife and are a critical component for migrating landbirds. These habitats were degraded by historic overgrazing and need special attention to speed recovery, where possible.

#### Recommended Actions:

- Strive to remove 25 streams from DEQ water quality limited list within 5 years by enhancement of stream conditions.
- Enhance conditions on 40 to 75 miles of streams administered by Burns District BLM.

- Prevent degradation of streams that currently meet water quality standards to conserve aquatic habitat values.
- Install adequate fish passage and screening facilities at irrigation diversions.

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