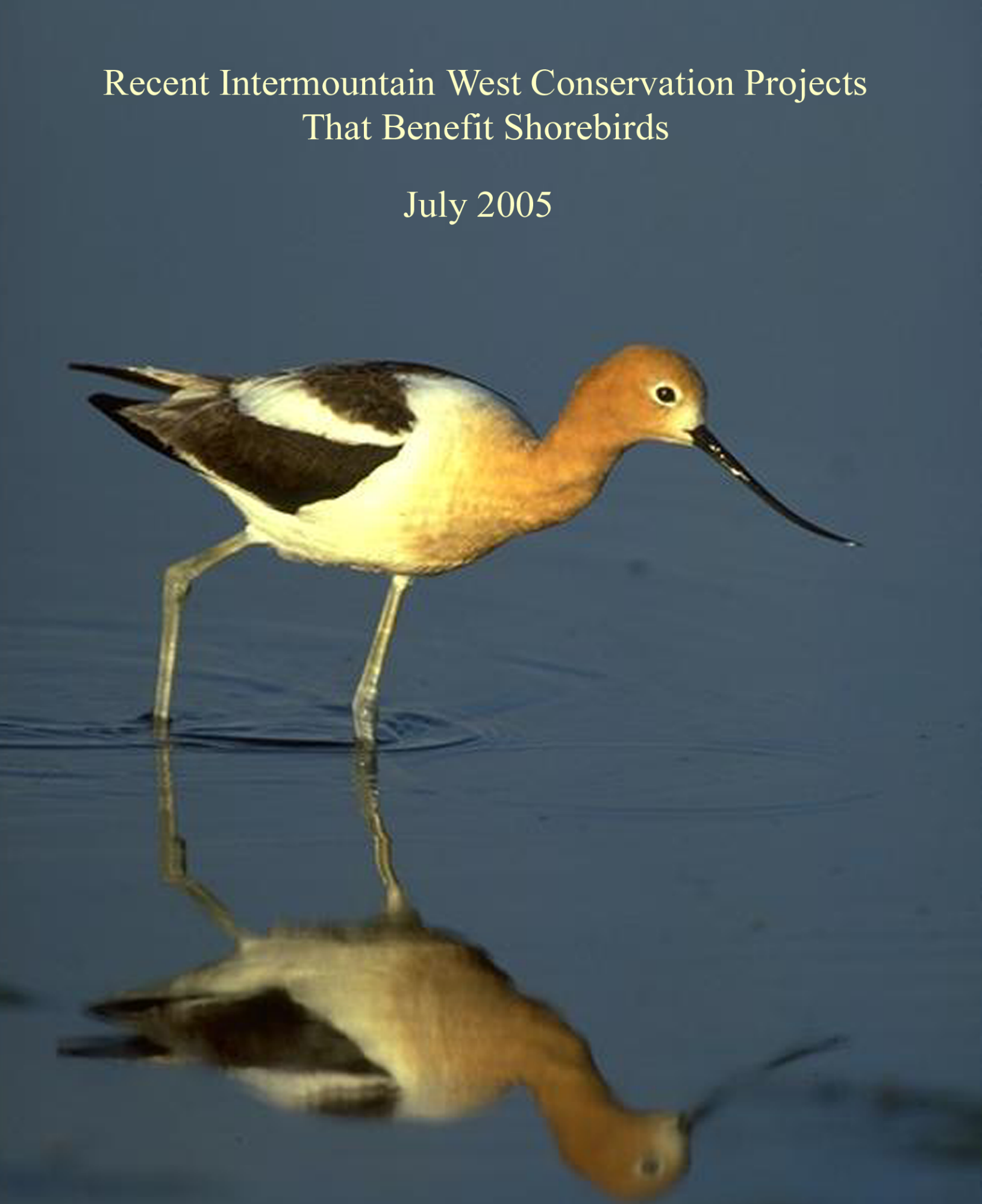
Recent Intermountain West Conservation Projects That Benefit Shorebirds

July 2005



Compiled and edited by Sue Thomas for the Intermountain West Shorebird Working Group

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PARTNERS

The partnerships associated with the Intermountain West Shorebird Working Group are vast and varied. The list of partners, below, includes active members of the working group, and other organizations that have initiated projects to benefit shorebirds summarized in this report. The working group appreciates the efforts of these partners and the unique attributes and abilities used by each partner to facilitate efficient and successful implementation of conservation activities. Many of the projects summarized in this report would not be as successful without the support of these partnerships. The working group is interested in identifying new stakeholders and developing new partnerships to further the effort of shorebird conservation in the region. Interested parties can contact Sue Thomas, Intermountain West Regional Shorebird Plan Implementation Chair, at sue_thomas@fws.gov or 503-231-6164 or contact one of our Committee Chair members: Lew Oring, Research Committee at oring@ers.unr.edu or 775-784-4621; Suzanne Fellows, Communication and Coordination Committee at suzanne_fellows@fws.gov or 303-236-4417; Rex Sallabanks, Monitoring and Assessment at rsallabanks@idfg.state.id.us or 208-334-2920.

American Bird Conservancy
Americorps
Audubon Wyoming
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- National
- Arizona
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- Utah

Bureau of Land Management
California Department of Fish and Game
Canadian Wildlife Service
Colorado State University
Colorado Natural Heritage Program
Confederate Tribes of the Umatilla Indian Reservation
Conservation International
Ducks Unlimited
Fallon Convention & Tourism Authority
Great Basin Bird Observatory
Idaho Department of Fish and Game
Inland Sea Shorebird Reserve
Intermountain West Joint Venture
Manomet Center for Conservation Sciences
National Fish and Wildlife Foundation
National Park Service
National Science Foundation
Nevada Department of Wildlife
Oregon Dept. of Fish and Wildlife
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Oregon Hunters Association
Oregon State University
Playa Lakes Joint Venture
PRBO Conservation Science
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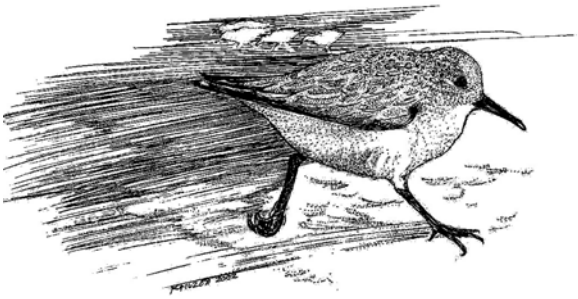
Rocky Mountain Bird Observatory
Rocky Mountain Center for Conservation Genetics and Systematics
Saskatchewan Wetlands Conservation Corp.
SIMERNAP
Six Springs Ranch
Sonoran Joint Venture
SW Regap
Sundown River Ranch
Teton Regional Land Trust
The Nature Conservancy
University of Denver
University of Missouri
University of Montana
University of Nevada - Reno
University of Washington
University of Wyoming
US Army Corp of Engineers
USDA, Natural Resources Conservation Service
USFWS
- National Wildlife Refuge System
- Migratory Birds and Habitat Programs
- Ecological Services – Private Lands
- Shorebird Sister Schools Program

USFS
USGS
Forest and Rangeland Ecosystem Science Centers
Fort Collins Science Center
Utah Division of Wildlife Resources
Washington Dept. of Fish and Wildlife
Weber State University
Western Hemisphere Shorebird Reserve Network
Wetlands Conservancy
Wetlands International
Wyoming Game and Fish Department



INTRODUCTION

This report summarizes current or recent projects that benefit shorebirds in the Intermountain West Region. This region encompasses portions of 11 states in the intermountain west, from the Sierras and Cascades to the Rocky Mountains and from the Mexican border to the Canadian border. This summary is intended to assist the Intermountain West Shorebird Working Group with evaluating progress in implementing the regional plan to date and to assist with identifying gaps in implementation.

Forty-seven projects are summarized here. Each project description related to at least one of the five overall goals described in the Intermountain West Regional Shorebird Management Plan. These goals, and the number of projects reported in this document, include the following: habitat management (with 14 projects reported), monitoring and assessment (10), research (10), outreach (4) and planning (9). This is a working document and will be updated as further information is forthcoming. Long-billed Curlew, Snowy Plover, and Mountain Plover (see list of scientific names at the end of this report), species of high conservation emphasis in the region, were the focus of 10 intensive studies over the past five years. It should be noted that this report reflects only those projects reported by working group members or their partners. For this reason, it should not be considered a comprehensive listing of projects.

The inspiration for this first summary report came from a similar publication by the Alaska Shorebird Group titled "Summaries of Ongoing or New Studies of Alaska Shorebirds During 2004" edited by Bob Gill. This report will be posted online at http://www.fws.gov/shorebirdplan/RegionalShorebird/RegionalReports.htm. The images in this report were provided by George West and Mark Rauzon. The cover photo was taken by Don Baccus.

Please contact the individuals noted as the primary contacts for more information on a specific project or contact Sue Thomas at sue_thomas@fws.gov, 503-231-6164 with updates or information on new projects in the region.

HABITAT MANAGEMENT

McNary and Umatilla NWR Shorebird Projects

Contact: Howard Browers, Mid Columbia NWRC at 509-545-8588 or howard_browers@fws.gov

International Shorebird Survey (ISS) data reveal that the mudflats within the Wallula Delta provide important shorebird habitat for up to 7000 shorebirds annually. This area is particularly important during fall migration, however habitat availability has varied in the past due to changing pool levels upstream from the McNary Dam. In an effort to elevate this issue, the refuge recently requested the ACOE institute a 'soft constraint' to reduce pool levels for as long and as many times as possible for two months from mid-August to mid-October. ISS data shows that over half the shorebird use days on the delta occur during fall. The predominant species to pass through the area include Long-billed Dowitcher, Western Sandpiper, and Killdeer. Various habitat management options are under consideration for this area including reducing disturbance by off road vehicles in closed areas through additional signage and increased enforcement and control of invasive species. An adjacent floodplain was restored in 2003 to provide additional wetland and riparian habitat for breeding American Avocets and Black-necked Stilts as well as migrant shorebirds. Management plans for this area include staged drawdowns during spring to provide nesting habitat for shorebirds.

The Long-billed Curlew is identified as the highest priority breeding shorebird for these refuges and is a conservation target for the Refuge Comprehensive Conservation Plan under development. On these refuges, Curlews nest in shrub steppe habitat characterized by native grasses with scattered bitterbrush. Sloughs and adjacent alfalfa fields are important foraging areas for curlews. This year, we will implement a modified version of the Range-wide monitoring protocol to establish base-line data for this species. Within future restoration projects on or near curlew nesting areas, habitat management requirements for curlews will be considered including species, height and density of grasses and shrubs; cool season burning to reduce impacts to nesting curlews; and monitoring agricultural practices for alfalfa to assess potential impacts from first cutting to breeding curlews. Curlew nesting success and population trends will be monitored for all restoration projects in known/potential curlew habitat.

The islands and banks of the Columbia River, within the boundaries of these refuges, also provide important stopover habitat for migrant shorebirds and breeding habitat for Black-necked Stilts and American Avocets. The islands are closed throughout the year, however studies conducted during the 1980s to evaluate the effects of pool levels associated with the dam projects identified significant erosion problems on the islands. Management plans include control of erosion and habitat improvements to breeding areas for priority shorebirds.

Moist Soil and Water Management at Columbia NWR

Contact: Randy Hill, Columbia NWRC, 509-488-2668 or randy_hill@fws.gov

Water management for moist soil plant production and multi-species migratory bird management are ongoing at this Refuge. Water manipulations, substrate alterations and changes in tilling practices are varied seasonally and annually to determine plant and bird response. Control of invasive plant species is of high concern particularly for saltcedar, Russian-olive, phragmites, purple loose strife, reed canary grass, and cottonwood.

Over half of the moist soil management units are managed for shorebirds and waterfowl with an emphasis placed on periods of migration. Recently, an extended period of irrigations was initiated which reduced competition for water between the units and increased foraging opportunities for migrant shorebirds. In the future, management will look at changes to the gradient of moist soil management units to further increase drawdown periods to 2-3 weeks.

Spring flooding begins in March. Drawdown begins in April and is generally completed by the end of May allowing for migrant shorebird foraging opportunities. One or two irrigations in June/July and July/August benefit migrant and breeding shorebirds with isolated roosting islands and ample foraging opportunities. Drying and mechanical work (mowing, disking, weed control) occur during August and fall flooding begins in August or early September and continues through December.

Wanaket Wildlife Mitigation Area

Contact: Jenny Barnet, Confederated Tribes of the Umatilla Indian Reservation at 541-966-2389 or JennyBarnett@ctuir.com

Wanaket Wildlife Mitigation Area is managed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under contract with BPA to protect, enhance, and mitigate wildlife and their habitats. The project provides partial mitigation for habitats impacted by the construction of the McNary Hydroelectric Power Projects.

The 2,817 acre Wanaket Wildlife Area is located in northeastern Oregon and lies adjacent to the south shore of the Columbia River along Lake Wallula between the Port of Umatilla and Hat Rock State Park. Shorebirds are common in the area. The area consists primarily of sagebrush dominated shrub/steppe habitats and emergent wetlands that occur in small closed basins known as "the McNary Potholes." Through a partnership with Ducks Unlimited and the Oregon Hunters Association, a flood irrigation system was enhanced to irrigate potholes and approximately 160 acres of emergent wetlands. Irrigation practices are designed to provide foraging habitat for shorebirds in late summer. Cover types provided by wetland and riparian areas include emergent wetland, sand/gravel/cobble/mud types, riparian shrub, and riparian tree.

Wetland Creation for Shorebirds at Kootenai NWR

Contact: Dianna Ellis, Kootenai NWR at 208-267-3888 or dianna_ellis@fws.gov or Aaron Drew, now at Grey's Lake NWR at 208-574-2755 or aaron_drew@fws.gov

In 2003, Kootenai NWR completed a 175 acre wetland restoration project on the north end of the refuge. One of the units restored was set aside for experimental shorebird habitat management, a habitat type we have not managed for in the past. The West River's Bend Unit was plowed/disced, planted to wheat, and then flooded during spring, 2004. The unit itself is a very shallow flooding unit, mostly sheet water. The strategy was to keep most of the unit in sparse vegetation early in the year while the wheat is still emerging and just starting to green up. This left a large amount of mudflat habitat for shorebirds. The unit was then flooded and drawn down repeatedly throughout the spring and summer. Once the wheat matured, the unit was tilled and replanted following a similar reflooding schedule.

One week after the first flooding, 12 Long-billed Curlews were observed foraging in the new habitat while at full pool (50% sheet water and 50% sparse green emerging wheat). In addition to curlews, we have seen Wilson's Phalarope, Spotted Sandpipers, and Killdeer using the new wetland. This is

significant for Kootenai as traditionally Killdeer have been the only species of shorebird using the refuge in any significant numbers with small numbers of other shorebirds passing through in the fall.

Malheur NWR Wetlands Management
Contact: Richard Roy, Malheur NWR at 541-493-2612 or richard_roy@fws.gov

Malheur NWR is important to several priority shorebird species in the Intermountain West during migration including Western Sandpiper, Wilson's Phalarope, Long-billed Dowitcher, and American Avocet. If numbers of American Avocets reported by Page et al. in 1999 are representative of Pacific Flyway population numbers, then the Harney Basin (including Malheur NWR) would qualify as a Regional WHSRN site supporting approximately 10% of the Pacific flyway population during peak flights in the fall migration. The Refuge is not as important to breeding shorebirds relative to the high numbers observed during migration, however the Refuge does provide breeding habitat for Wilson's Phalarope, American Avocet, Willet, Wilson's Snipe, Killdeer, Long-billed Curlew, Spotted Sandpiper, Black-necked Stilt and Snowy Plover.

Management for shorebirds in the area is compounded by water availability, thus the Refuge has taken a habitat management approach to managing for wildlife. Over the last few years Malheur NWR has been addressing longstanding water rights, water quality, fish passage and screening, invasive species, and water management issues. In response to these complex issues, the Refuge has implemented a "water rights" settlement with the local community. This settlement was drawn up between the Refuge and the local community as a solution to an ongoing water right application dispute process. This settlement is a positive outcome. Given the fact that Malheur is located in a desert and water availability is almost entirely driven by snow-pack, we have embarked on a quantitative water management planning process for our activities. The process is driven by hydrologic modeling starting with annual snow pack measurements and predicted watershed discharges based upon snow pack and water content. We "know", through recent monitoring, how much water it takes to manage wet meadows, wetlands of different types, E/T (evapotranspiration), water delivery efficiency etc. With this model in place, we will be better able to make water and habitat management decisions during drought conditions and manage wetland habitats more effectively. The Refuge is continuing on with its battle with common carp, perennial pepperweed, Canada thistle, poison hemlock, field bindweed, and phragmites.

Foster Slough Wetlands Complex Protection, Restoration/Enhancement and Management
Contact: Robert Cavallaro, Teton Regional Land Trust at 208-354-8939, rob@tetonlandtrust.org

The Foster's Slough area is a highly productive complex of wetlands and associated uplands along the Upper Teton River in Teton County, Idaho that provides breeding habitat for a large population of long-billed curlew. Other nesting shorebirds in the area include willet, Wilson's phalarope, killdeer, Wilson's snipe and spotted sandpiper. In 2004 Teton Regional Land Trust (TRLT) biologists participated in the range-wide long-billed curlew survey. Over 70 curlews were counted in a Foster's Slough pre-nesting survey and TRLT estimates that 50 curlew pairs may breed throughout the complex. TRLT has also collected or is collecting other relevant waterbird ecology data that will be vital to planned restoration and management in the Foster's Slough Area. Some of the efforts include waterfowl brood counts and brood habitat evaluations, other waterbird pair and brood counts, identification of trumpeter swan winter concentration areas, and Sandhill crane nesting and roosting surveys. To date TRLT has worked with willing landowners to protect over 2,000 acres of the Foster's Slough area through conservation easement agreements. Several new land protection projects within the Foster's Slough area are planned for 2005

and 2006. Land protection in the Foster's Slough Area has been greatly accelerated by funding from North American Wetland Conservation Act funds, which are used to purchase "bargain-sale" easements.

Much of the Foster's Slough complex provides important forage resources for ranching families that have contributed significantly to the conservation of the area. To facilitate continued viability for ranching operations and improved viability of fish and wildlife in the area TRLT and landowners are developing a grass banking system whereby non-ranching landowners allow some grazing on their properties to ranch families operating within the Foster's Slough area. The benefit to non-ranching landowners that allow some grazing on their property is vegetation management and weed control on their own land while aiding landscape-scale habitat improvements. The benefit to the Foster's Slough complex is reduced grazing pressure on sensitive areas such as spring creek corridors and waterbird nesting and brood habitat. TRLT is currently working with the Natural Resources Conservation Service in developing a grass banking/grazing management plan that incorporates approximately 850 acres of land within the Foster's Slough complex. Greater flexibility in grazing management from grass banking will allow us to exclude a large portion of spring creek corridors from future cattle grazing starting in 2005 and increase nesting/brooding cover for priority ground nesting birds such as waterfowl, Sandhill cranes and long-billed curlew.

Six Springs Ranch Moist Soil Unit and Waterbird Management Project

Contact: Robert Cavallaro, Teton Regional Land Trust at 208-354-8939 or rob@tetonlandtrust.org , or Dennis Mackey, Snake River Fish and Wildlife Office at 208-378-5267 or dennis_mackey@fws.gov

The Six Springs Ranch is located west of Highway 33 approximately 1.25 miles south of Driggs, Idaho in Teton County. We propose to enhance existing waterbird habitat on the Six Springs Ranch. The 847-acre ranch is currently protected via a conservation easement agreement and the Teton Regional Land Trust is the primary manager of the property. Our goal is to combine cattle/hay production with waterbird management. The current cattle management regime in this area maintains residual spring nesting cover in grass and hay. Also, hay is not cut prior to July 15 to allow grass-nesting species to fledge. Three ponds were created at springheads by past landowners to impound water for agricultural use. The ponds currently provide limited habitat for waterbirds due to the lack of bank and emergent vegetation. The ponds comprise about 1.5 acres of open water habitat. A 15-acre fallow field lies just east of the three ponds. To maximize waterbird production in this area we plan to establish hard-stemmed bulrush in the three ponds to create cover for broods and habitat diversity in general. Also, we will convert the fallow field to a moist soil management area whereby every summer; vegetation is grazed or lightly tilled and then flooded for the late-summer-fall migration. The unit may also be flooded in spring depending on water availability. This project will be especially beneficial to migrating shorebirds, waterfowl and colonial nesters such as white-faced ibis and Franklin's gull. An additional goal is to serve as a demonstration project for local agricultural producers interested in wildlife enhancement; and as conservation outreach for the general public. The moist soil management area is adjacent to a county road that affords a potential wildlife viewing area.

Sundown Ranch Waterbird Conservation and Restoration
Contact: Robert Cavallaro, Teton Regional Land Trust at 208-354-8939 or rob@tetonlandtrust.org

In 2003, Teton Regional Land Trust (TRLT) in partnership with the landowners initiated a habitat enhancement and restoration project on the 240-acre Southern Parcel of the Sundown River Ranch located along the west shore of the Teton River in Teton County, Idaho. Work was completed on the Sundown Ranch in 2004 and included shallow wetland enhancement (3.5-acre) and pond creation (7-acre) to benefit brooding long-billed curlew and willet, as well as other nesting and brooding waterbirds. The *Curlew Pond* was created by constructing a low-level dike and enhancing existing wetland habitat. Marsh surface was salvaged during excavation and placed along pond edges, and where possible, sedge and spikerush dominated wetlands were left in tact. Disturbed upland areas are seeded with native grasses. A second degraded wetland (7-acre) was enhanced and a deeper pond was constructed. The *Trumpeter Pond* has two nesting islands with surrounding deep-water zones for security. The pond is expected to naturally colonize with submerged aquatic vegetation within 2-3 years. Disturbed soil surfaces are revegetated with native wetland plants, as described above for the curlew pond. The design is optimal for trumpeter swan nesting and foraging habitat, but island and emergent habitat will benefit a variety of species particularly amphibians and selected waterbirds. Excavated materials from the ponds were deposited in uplands on-site and shaped to create topographic diversity. This area was planted with native grass and shrub plantings to benefit sharp-tailed grouse, passerines, and big game. A 5-acre grain foot plot was planted in the northwestern part of the parcel to benefit pre-migration staging Sandhill cranes and waterfowl.

Also, a degraded spring creek was restored to a more naturally functioning condition to provide seasonal trout habitat. Sediment was excavated exposing underlying gravels, log channel constrictors placed, and v-notch weirs installed. Riparian zones were restored utilizing wetland sod salvaged from construction activities on site. A stretch of the Teton River had bank reshaping and fiber mats placed for soil stabilization. This area was planted with cultivated wetland sod in Spring 2004. Willows (Bebb, Geyer and Booth willow) were planted in 2003 to restore and stabilize the riverbank.

Ruby Lake NWR Habitat Improvements
Contact: Jeff Mackay, Ruby Lake NWR at 775-779-2237 or jeff_mackay@fws.gov

Ruby Lake lies in a closed drainage basin along the eastern flank of the rugged and scenic Ruby Mountains. The Ruby Valley has long been know as an important breeding site for Long-billed Curlews and the Refuge is no exception. In the early 1990's, Ruby Lake NWR restored over 2,000 acres of dry meadow and grasslands with prescribed burns to reduce the amount of rabbitbrush in these habitats. In 1995, staff also removed cattle from the Refuge. Since restoration, Curlews have extended their breeding territories and native grasses have begun to thrive in the restored areas. In addition, staff are assessing these areas for wildlife response on a regular basis and have found a significant increase in density and diversity of grassland-nesting birds.

Shorebird Use and Habitat Management on Camas NWR
Contact: Rob Larranaga, Camas NWR at 208-662-5423 or rob_larranaga@fws.gov

Several pairs of Long-billed Curlew breed on Camas NWR. Last year, Curlews were observed using a recently burned area on the refuge. Given the increase in concern for this species, further emphasis will be placed on Long-billed Curlew in the Refuge's biological monitoring program in traditional and recently burned areas..

American Avocet, Black-necked Stilt, Willet, yellowlegs sp., Pectoral Sandpiper, Red-necked and Wilson's Phalaropes use Camas NWR on migration. Limited numbers of Long-billed Curlew, American Avocet, and Black-necked Stilt breed on the Refuge. Although no periodic surveys were run in the recent past specifically for shorebirds, surveys of our wetlands for bird use will be done under the Idaho Bird Inventory and Survey monitoring program this year (see IBIS summary in this document).

Habitat management is the key function of staff on Camas NWR. Activities include flooding and subsequent discing of moist soil units as well as farming of upland units to provide forage for wildlife. Control of Russian Knapweed is of primary concern on the refuge and is address by several different methods. Shorebird habitat needs are addressed in units known to support breeding and migrant shorebirds. These activities are evaluated annually in a Habitat Management Plan.

Cokeville Meadows NWR Habitat Improvements
Contact: Alison Lyon, Audubon Wyoming at 307-721-8779 or alyon@audubon.org

Cokeville Meadows National Wildlife Refuge was established on the Bear River south of Cokeville, Wyoming in 1993 to protect wetland and riparian habitats associated with the Bear River. The Refuge contains a mosaic of wet meadows and cattail/bulrush sloughs that provide valuable nesting, brood rearing and staging habitat for a variety of migratory birds. The area, recently accepted as an Important Bird Area by Audubon Wyoming, provides nesting habitat for 32 waterbird and waterfowl species including Sandhill cranes, white-faced ibis, black terns, black-necked stilt, American bitterns, redhead, mallard, and black-crowned night herons. In addition, sixty-five species of shorebirds, waterbirds, and waterfowl use the area as a migration stopover. Sage-grouse use upland and riparian areas for nesting and brood-rearing. The area also provides habitat for mule deer, antelope, and elk. To date, 6,417 acres in fee title and 1,689 acres in conservation easement have been acquired for the Refuge, which will total 26,657 acres when complete.

Habitat improvement projects will be initiated in the summer of 2005 and will be completed by summer 2007. The goal is to establish water management structures on the Refuge's 2,151-acre Thornock and the 2,250-acre Etcheverry tracts. Water control structures and ditches will be constructed and the primary levees will be widened. Completion of these projects will allow the Refuge to manage wetlands independently of adjacent water users and maintain open water areas for longer periods to improve brood success of waterfowl and other bird species. Extending the amount of time when wetlands remain flooded will additionally benefit feeding and resting birds during spring and fall migration. Finally, the infrastructure established during this project will also improve nesting habitat in the future. An estimated 2,220 acres of wetlands will be improved by this project, including about 400 acres that can be managed as emergent marsh habitat. Partners in this project include: Audubon Wyoming, United States Fish and Wildlife Service, and the Wyoming Game and Fish Department. The project is being funded by the Intermountain West Joint Venture Cost Share Grant.

Wetland Restoration At Ouray NWR, Utah
Contact: Dan Alonso, Ouray NWR at 435-545-2522 x 222 or dan_alonso@fws.gov,

Ouray NWR lies in the Uintah Basin of northeast Utah. It is a 11,987 acre Refuge consisting of riparian woodland, floodplain wetlands, upland grasslands, and shrublands. Sixteen miles of the Green River flows through the Refuge. Several alterations to the physical structure and ecological processes of the Green River have occurred since the Refuge was established. Most significant has been the construction of the Flaming Gorge Dam upriver from the Refuge which changes flood frequency, duration, peak and base loads, and several other components. Other major changes also include construction of levees, ditches and water control structures on the Refuge in attempts to manage the wetlands in a more permanent wetland regime than they were intended. Recent completion of the Refuge Comprehensive Conservation Plan and research conducted by Mickey Heitmeyer and Leigh Fredrickson of Gaylord Laboratory, University of Missouri, which produced "An Evaluation of Ecosystem Restoration and Management Options for the Ouray National Wildlife Refuge" has initiated restoring the wetlands to a more historic seasonal, semi permanent structure.

More research and investigation is needed to determine the best methods of restoring the wetlands while still providing historic flooding with reduced river flows, but much has already been accomplished. While converting the wetlands from permanent and semi permanent to semi permanent and seasonal impoundments will likely reduce waterfowl and waterbird production, but will provide improved habitat for migrating shorebirds. Flooding of the wetlands will be more dependent on river flows, but even in years of high water, several of the wetlands will be allowed to dry out annually or bi-annually both in fall and spring. In addition, the emphasis of management for seasonal and semi permanent wetlands also has the purpose of reducing the amount of perennial vegetation that is created with more permanent wetlands. Changes in the flooding regime and vegetation structure will significantly increased habitat opportunities for shorebird use than in past years.

Browns Park NWR Moist Soil Management
Contact: Suzanne Beauchaine, Browns Park NWR at 970-365-3613 x203 or suzanne_beauchaine@fws.gov

Through partnership with Ducks Unlimited, staff at Browns Park NWR are managing wetlands created in the late 1960's through 1980's. These wetlands are located along the Upper Colorado River Ecosystem - specifically along the Green River in northwest Colorado. While not a major area for shorebirds we observe a few hundred birds during migration and if conditions are right, Spotted Sandpiper, Black Necked-Stilt and American Avocet successfully nest here. Wetland units are flood irrigated from February till freeze up. Water management is done with pumps, gravity fed water and ditch systems. The primary management objective is to provide waterfowl migration and breeding habitat, however several wetlands are shallow flooded or have exposed mudflats during shorebird migration periods. This is an annual project that provides migratory shorebird habitat.

Conservation for Shorebird Habitat within Utah's BHCAs and IBAs

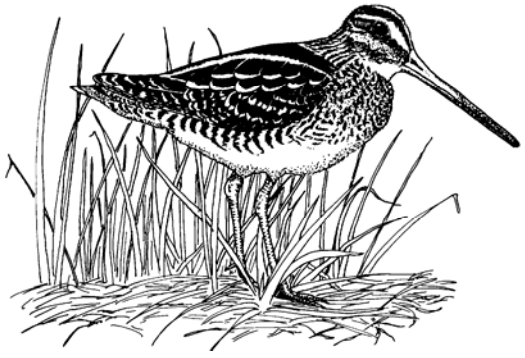
From Wayne Martinson, current Chair of Utah IWJV Steering Committee and National Audubon Society Utah IBA Coordinator at wmartinson@audubon.org

The following provides very brief information on shorebirds within Utah's Bird Habitat Conservation Areas (BHCAs) and Important Bird Areas (IBAs) as well as some comments on conservation efforts.

The Intermountain West Joint Venture (IWJV) is an implementation component of the North American Waterfowl Management Plan. The IWJV works to identify, protect, restore and enhance wetlands and other important habitats for waterfowl and other birds. The Utah all-bird plan for the IWJV includes 56 Bird Habitat Conservation Areas (BHCAs). Go to Plans then Utah on the www.iwjv.org website. The BHCAs were determined by experts in the various regions of the state and agreed upon by the Utah State Steering Committee. The 56 BHCAs include over 10% of Utah's land mass. Each of the BHCAs list priority birds. 26 of the 56 BHCAs list shorebirds as priority birds within the BHCAs. Many of the BHCAs provide for a number of shorebird species that are part of the Intermountain West Regional Shorebird Plan priority species – for example 17 of the 20 species are within the Great Salt Lake BHCA. Five of the BHCAs list only one shorebird species – the Long-billed Curlew.

The Important Bird Area program is an international, national and statewide effort to identify, monitor and conserve important habitat for birds. The Utah Important Bird Area Program has announced 15 sites and two more sites are essentially completed. See www.audubon.org/bird/iba/utah for more details on the Utah IBA program. The 17 IBA sites comprise over 2.5% of Utah's land mass. IBA nominations often meet more rigorous criteria, provide additional survey data and offer additional detailed information as compared to the information on BHCAs. Twelve of the IBA sites have been nominated at least in part due to survey data showing significant shorebird use. Currently in Utah, landowners and/or land managers must give their approval for a site to become an IBA. The five major bays of Great Salt Lake have been nominated as global IBAs. Six shorebird species (American Avocet, Black-necked Stilt, Long-billed Dowitcher, Marbled Godwit, Wilson's Phalarope and Snowy Plover) easily meet the criteria of having over 1% of their world's population on four of the major bays of Great Salt Lake on a regular basis.

For the future, the Intermountain West Regional Shorebird Planning efforts can look towards both the BHCAs and the IBAs as areas within Utah to address monitoring and habitat needs for shorebirds. The BHCAs provide a broad umbrella of known and important shorebird use. The IBAs are generally "nested" within the BHCAs. Both programs seek to develop partners to conserve the identified areas. The IWJV has a cost share program that helps provide funding for BHCAs.



MONITORING AND ASSESSMENT

Long-billed Curlew Rangewide Breeding Survey

Contact: Stephanie Jones, USFWS – Migratory Birds and State Programs, Region 6 at 303-236-4409 or stephanie jones@fws.gov OR Sue Thomas, USFWS – Migratory Birds and Habitat Programs, Region 1 at 503-231-6164 or sue_thomas@fws.gov OR Bill Howe, USFWS -- Migratory Birds and State Programs, Region 2 at 505-248-6875 or bill_howe@fws.gov

U.S. Fish & Wildlife Service (USFWS) and the U.S. Geological Survey (USGS) initiated a two-year survey across the known breeding range of the Long-billed Curlew in the spring of 2004. The primary goal is to provide a more accurate estimate of the number of breeding Long-billed Curlews across their breeding range in 16 western U.S. states and three Canadian provinces. Stratified random routes sample nesting habitat within shrub- and grasslands. Surveys are timed to coincide with the local pre-incubation period (March-May), when breeders are more likely to be detected. Within each local time period, crews survey along 32-km routes following a double observer protocol. All Long-billed Curlews detected along the route, their behavior and habitat variables are recorded. Upon completion of the two-year study, USGS biologists at the Fort Collins Science Center will conduct a statistical analysis of results. Guidelines to set a long-term monitoring plan for Long-billed Curlew can then be developed.

This project is financially supported through a USFWS/USGS Science Support Grant. Personnel from National Wildlife Refuges, state and provincial wildlife and nongame natural resource divisions, as well as regional Bureau of Land Management and U.S. Forest Service offices have been extremely supportive in assisting with surveys and seeking additional funding. For more information visit http://mountain-prairie.fws.gov/species/birds/longbilled_curlew/.

Long-billed Curlew Monitoring Surveys: Population Estimates, Trend Analysis, and Habitat Associations on The Hanford Reach National Monument/Saddle Mountain NWR

Contact: Heidi Newsome, Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge at 509-371-1801 or heidi_newsome@fws.gov, kevin_goldie@fws.gov

The Long-billed Curlew is identified as the highest priority breeding shorebird for the Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge (HRNM/SMNWR). Curlews nest in shrub steppe habitat characterized by native grasses with scattered shrubs, and in formerly disturbed areas (i.e. old agricultural fields) now dominated by cheatgrass on the HRNM/SMNWR. This year, the refuge implemented a modified version of the Range-wide monitoring protocol to establish base-line data for this species. To improve understanding of local breeding populations, their habitat associations, their trends, and to better meet the objectives and purposes of the HRNM/SMNWR the survey protocols have been developed based on those developed by Saunders (2001), Jones et al. (2003), and Fellows (2004).

The objectives of the HRNM/SMNWR long-billed curlew survey are: 1) to develop local population estimates of long-billed curlews, 2) to determine habitat relationships of breeding long-billed curlews, 3) to develop long-term trends of local curlew populations, 4) to develop maps of curlew breeding areas and habitats to facilitate future management decisions, and 5) to provide incidental sighting information of other wildlife species of concern for inclusion in state wildlife and in local heritage databases.

HRNM/SMNWR survey routes were assigned based on geographic information system (GIS) data files of existing drivable roads, vegetation cover types queried to reflect long-billed curlew habitat requirements, and local and landscape slope measurements. "Survey routes" as they are defined in these surveys are segments of existing roads that either have a significant portion of their length passing through potential long-billed curlew habitat, as determined by GIS classification, or are the closest viable route passing through an area of interest (e.g., through a management unit that has limited road access). In other words, since the local habitats are incongruous in relation to the available roads routes have been laid out to obtain the best available sampling coverage in relation to the geography and political boundaries. In this fashion survey results can be stratified post-survey to obtain population estimates by habitat and by management area.

International Shorebird Survey Sites in the Intermountain West

Contact: Brian Harrington, Manomet Center for Conservation Sciences, at 508-224-6521 or bharr@manomet.org

In 1974, Manomet Center for Conservation Sciences organized the International Shorebird Survey (ISS) to gather information on shorebirds and the wetlands they use. Since then, the site network has grown to approximately 1200 locations in 47 states monitored during migration and winter (optional). Data have been used in developing goals and objectives in the U.S. Shorebird Conservation Plan, to qualify sites for inclusion in the Western Hemisphere Shorebird Reserve Network (see description later in this document), and to assist land managers with habitat management decisions. This is a volunteer-based survey.

ISS sites that were covered in 2003 and/or 2004 in the Intermountain West are:
Owens Lake (7), CA
Arapaho NWR (2), CO
American Falls Dam/Willow Bay, ID
Lee Metcalf NWR, MT
Bosque Del Apache NWR (2 sites), NM
Las Vegas NWR, NM
Maxwell (5), NM
Fish Springs NWR, UT
Walla Walla River Delta, WA

Thank you to all of you who have contributed data in the past! ISS is currently working to strengthen and build their monitoring network by joining forces with the Program for Regional and International Shorebird Monitoring (PRISM). PRISM seeks to coordinate existing shorebird monitoring efforts such as the ISS. The closer coordination and expanded survey effort will significantly increase the power of statistical analyses of shorebird population trends and more clearly define shorebird conservation issues. We are currently looking for new sites in the Intermountain West. The US Shorebird Council, Regional Working Groups and partners have developed a list of sites that would be perfect for inclusion in our site network. The list can be found on-line at http://www.fws.gov/shorebirdplan/RegionalShorebird/downloads/ShorebirdSites5_02.xls. Becoming a cooperator and nominating a new site is easy, simply go to http://www.shorebirdworld.org/index.php, the International Shorebird Survey. Or contact us if you have any questions. Good Shorebirding!

Great Salt Lake Waterbird Survey 1997-2001

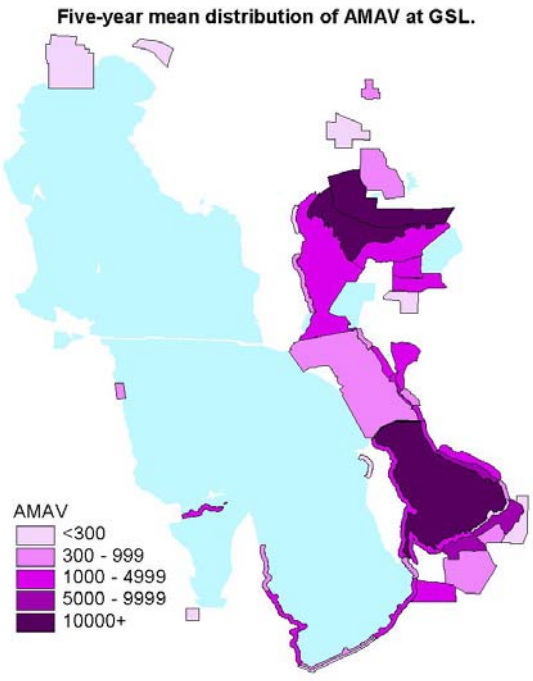
Contact: Don S. Paul, Intermountain West Joint Venture at 801-876-3689 or avocet@qwest.net or, Ann E. Manning and John Luft, Great Salt Lake Ecosystem Project, Utah DWR, at 801-537-3342 or johnluft@utah.gov

The Great Salt Lake (GSL) Waterbird Survey was conducted from 1997-2001 and examined the relationship of migratory waterbirds (including shorebirds) with the GSL ecosystem through the spring, summer and fall seasons, between years, and across a variety of habitats. An important part of the ecosystem is the dynamic lake elevation, which during the study period ranged from 1,279-1,281 m (4199.3' to 4204.6') above sea level. This shift in water level causes dramatic changes in the availability and quality of habitat used by more than 55 species of waterbirds. The high lake elevation during the study was in 1999 and many stands of emergent vegetation were inundated and salt burned. As the lake receded to its lowest point during the study period in 2001, extensive mud bars were left exposed and void of vegetation. Counts of waterbirds at GSL were completed every ten days from April through September for five years and included the following families: *Gaviidae, Podicipedivae, Pelecanivae, Phalacrocoracivae, Ardeidae, Threskiornithidae, Anatidae, Rallidae, Gruidae, Charadriidae, Recurvirostridae, Scolopacidae,* and *Laridae*. Avian use of the GSL ecosystem measured by bird use days (one bird use day equals one bird spending 24 hours within the study area during the study period) were the lowest during the high water year (1999).

For this study the GSL ecosystem is represented by the GSL and its associated delta-formed wetlands. When the lake is at its long-term historic elevation of 1,281 m (4202 FAS) the lake surface area is 3,885 km^2, and the associated emergent marshes and non-vegetated mud flats and salt flats encompass 2,065 km^2 (Fretwell et al. 1996). The GSL Waterbird Survey covered approximately 21% of the total area, and approximately 28% of important waterbird habitat.

An examination of the five-year mean bird use days by suite reflects the importance of the lake to avocets, phalaropes, waterfowl and gulls, each present at GSL in the millions of bird days. The GSL bird use day five-year mean for all aquatic species was 86,752,258.

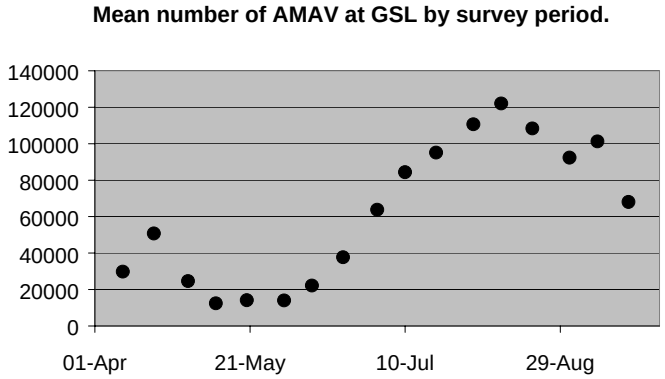
Species Accounts and an example from the report (American Avocet) - Each species account includes data collected from the Five-Year Waterbird Survey, and in many cases population estimates on a broader scale from outside sources (br = breeding adults; Morrison et al. 2001; Wilkens et al. 2000; NAWCP Appendix 4; Jehl 2001). Means for each survey period are calculated over five years (1997-2001) and displayed in each chart. The mean number reported in the table for GSL is an average of survey period means for selected months during which the species is present in abundance. The peak number reported is the largest of the survey period means. The high count is the largest count at GSL at any time throughout the five-year study. The year of the high count is noted. The abundance status is taken from a Utah birds checklist (Bromley and Webb 1995) and is included as a description of species occurrence. The map for each species reflects the distribution of the mean number across waterbird



survey areas as data were reported. Areas not shaded represent a count of zero.

American Avocet

	Population estimates		Great Salt Lake			
Code	Global	North America	Mean Jul-Sep	Peak 10-Aug	High Count 1997	Abundance Status
AMAV	450,000	450,000	94,006	122,083	204,878	C



Changes in Numbers of Nesting Snowy Plovers at Owens Lake

Contact: Miko Ruhlen and Gary W. Page, PRBO Conservation Science at 415-868-0371 or gpage@prbo.org or mruhlen@prbo.org

Fourteen lake-wide surveys for breeding Snowy Plovers have been conducted at Owens Lake over three decades. There was a steep decline from 499 adults on the first survey in 1978 to 195 on the second in 1988. Nine subsequent counts from 1990-2001 varied from 101-203 adults (mean = 138, SE = 11). After the introduction of water to large areas of the lake bed for dust control commencing in 2002, numbers of adults have increased annually to 658 in 2004. Shallowly flooded areas now account for 85% of the adults. The distribution of nests has also changed since the addition of water. The largest shallow flood project accounted for 71% and 61% of the nests found in 2002 and 2003, respectively, compared with only 27% in the area in 2001 prior to flooding. The nesting season has also been extended by about a month since birds began nesting in shallow flood areas. Snowy Plovers at Owens Lake have benefited from the shallow flooding for dust control, but are now more dependent on man-made habitat.

Interior Snowy Plover Monitoring in Oregon

Contact: Chris Carey, Oregon Department of Fish and Wildlife at 541-388-6363 or chris.g.carey@state.or.us

Oregon Department of Fish and Wildlife and partners from the BLM and USFWS have been monitoring interior Snowy Plovers since 1980 at traditional nesting sites in Lake and Harney Counties. As many as 19 locations east of the Cascade Mountains have been identified as breeding areas in Oregon. In some years appropriate habitat may be available for Snowy Plovers at up to 10 additional sites depending on water levels.

A drought cycle continues in southeast Oregon and water levels in the major basin lakes were down again in 2004. Harney Lake was dry except for a few springs and the outflow areas along the northwest shoreline from creeks draining out of the Warm Springs Valley. Alvord Lake was dry. At Lake Abert and Summer Lake, water levels were below normal. Rainfall amounts for the water year were 84% of normal for Lake County and 97% of normal for the Harney Basin. Conditions appear to be similar in 2005 as well.

Despite the low water conditions, plover numbers were up in most areas. Surveys in 2004 during the last two-weeks of June, tallied the highest number of adult plovers observed since 1980 with 909 birds reported. Approximately 100 chicks were observed during the survey period. The 381 plovers recorded at Summer Lake was an all time high count yet all sides of the lake were not surveyed. Plover locations at most of the major concentration areas in 2004 have been plotted with GPS units. Due to the changes in water levels and movement of plovers in the area, partners for this effort are very interested in coordinating inventories in surrounding states.

Great Salt Lake Annual Phalarope Survey

Contact: John Luft, Utah Division of Wildlife Resources at 801-537-3342 or johnluft@utah.gov or Don S. Paul, Intermountain West Joint Venture at 801-876-3689 or avocet@qwest.net

The Wilson's phalarope is a migratory species that uses the Great Salt Lake, Utah as a migration and molt staging site. Limited breeding also occurs at wetlands within the Great Salt Lake ecosystem and other northern Utah wetlands. In 1992, the Western Hemisphere Shorebird Reserve Network recognized the Great Salt Lake for its importance to shorebirds. The Great Salt Lake was given this notable recognition primarily because of its large population of Wilson's phalaropes. Up to 50% of the world's population of Wilson's phalaropes use the Great Salt Lake during the fall migration as a staging site to prepare for a nonstop flight to South America. This predictable behavior pattern provides opportunity to annually census Wilson's phalarope numbers on the Great Salt Lake. The Utah Division of Wildlife Resources has censused Wilson's phalarope on the Great Salt Lake in 1982 and 1984, and annually from 1986 – present.

Wilson's phalarope surveys are conducted on or near July 29. This has been determined to be the mean peak population period at the GSL for the species. There are also Red-necked Phalaropes present and numbers are recorded for this species, however Red-necked Phalaropes tend to peak later in August and early September. Phalarope numbers on the Great Salt Lake are counted by an aerial survey designed to estimate large flocks of staging phalaropes. The survey is flown in a counter-clockwise direction along the Great Salt Lake shoreline in order to place observers on the shoreline side of the aircraft. Open-water transects are also flown west to east from Carrington Island to Antelope Island and north to south from Antelope Island towards the south shoreline. To prevent observer duplication, transects were flown only once. Two observers make visual estimates for each transect and record these numbers onto a tape cassette for later transcription.

Idaho Bird Inventory and Survey

Contact: Colleen E. Moulton, Idaho Dept. of Fish and Game – Nongame and Endangered Wildlife Program at 208-287-2751 or cmoulton@idfg.idaho.gov,

The Idaho Bird Inventory and Survey (IBIS) is a plan to monitor all birds (waterbirds, shorebirds, and landbirds) in Idaho that most wildlife and land-management agencies would contribute to and benefit from. Importantly, IBIS is designed to be part of a new program called "Coordinated Bird Monitoring" (CBM) that is currently being developed at the national level (http://amap.wr.usgs.gov). CBM is a joint effort by managers and bird monitoring specialists to improve the success of bird monitoring programs, and make the information available to all partners. Its approach focuses on: (1) providing information on specific land-management issues from reliable monitoring data; (2) describing focal species and quantitative survey objectives for each management issue; (3) choosing survey methods and estimating needed sample sizes; (4) storing all data in permanent, widely available data repositories; (5) analyzing data using methods endorsed by the appropriate professional societies; and (6) using effective methods for communicating results to decision-makers.

Various state and federal agencies, land trusts, local Audubon chapters and private individuals are actively involved in the IBIS program. Pilot work for IBIS began in Spring 2004, where breeding season waterbird/shorebird surveys were conducted at several sites around the state, focusing particularly on Important Bird Areas. Notably, shorebird observations from the first year of this collaborative effort have already provided valuable information for Idaho's Comprehensive Wildlife Conservation Strategy. This effort continued in 2005, and we anticipate expanding efforts into Fall 2005 to begin monitoring of migratory shorebirds at key sites around the state.

Monitoring Colorado's Birds

Contact: Rich Levad, Rocky Mountain Bird Observatory at 970-241-4674 or rich.levad@rmbo.org

Monitoring Colorado's Birds (MCB) is a statewide monitoring program for Colorado that began in 1998 that aims to provide population trend data for all of the state's breeding bird species except game birds and T&E species. This program is funded by Colorado Division of Wildlife, Bureau of Land Management, and US Forest Service. Each year MCB conducts a suite of point-count or line transects in each of 14 habitats. The transects may yield sufficient data to calculate densities using Program DISTANCE for three species of shorebirds: American Avocet, Wilson's Snipe, and Wilson's Phalarope. MCB detected 14 American Avocets on four transects in two habitats, an insufficient sample for calculating density. In some years enough detections are obtained to make this calculation. MCB detected 35 Wilson's Snipe on 17 transects in seven habitats with a resulting density of 0.000003/ha and CV of 69.9%. MCB detected 32 Wilson's Phalarope on wetland transects and analysis yielded a density estimate of 0.52/ha, with a CV of 53% in that habitat. The addition of more wetland transects, along with eventual relief from drought, should enable us to effectively monitor this species.

MCB also conducts special surveys of species for which the transects produce insufficient data, including Snowy Plover, Black-necked Stilt, and Willet. RMBO volunteers and BLM field workers began annual surveys for Snowy Plovers in known and likely breeding sites in the state in 2003. This species nests on playas at Blanca Wetland in the San Luis Valley (126 adults counted in 2004) and reservoirs in the lower Arkansas Valley (88 adults counted in 2004). This species has historically nested in small numbers at Antero Reservoir in South Park, but has not been found there in these surveys. We have catalogued known Black-necked Stilt nesting sites and have conducted some surveys opportunistically. In 2004, we

visited only 10 of 29 historical sites. Only one was occupied (three pairs). We have conducted annual counts for Willets at known nesting areas since 1988. All but two of the known sites are in North Park in Jackson County.

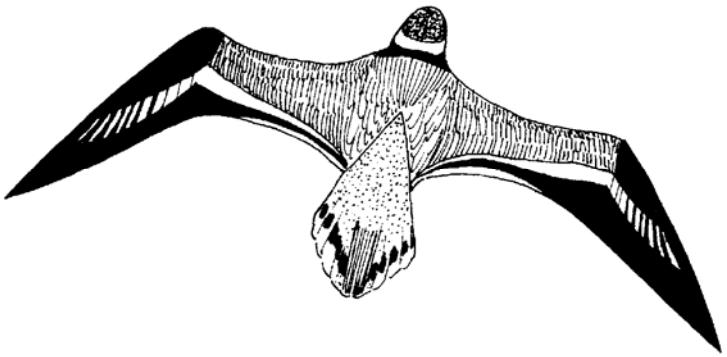
Nevada's Aquatic Bird Count

Contact: Elisabeth Ammon, Great Basin Bird Observatory at 775-323-4226 or ammon@gbbo.org

The Great Basin Bird Observatory's Aquatic Bird Count (ABC) is a volunteer effort designed to increase monitoring efforts of Nevada's aquatic bird species. Species groups include shorebird, waterfowl, waterbirds, marshbirds, and landbirds accounting for 73 focal species in the Great Basin region and 60 in the Mohave region. Focal shorebird species include Snowy Plover, Semipalmated Plover, Killdeer, American Avocet, Black-necked Stilt, Willet, Greater Yellowlegs, Lesser Yellowlegs, Spotted Sandpiper, Long-billed Curlew, Marbled Godwit, Dunlin, Western Sandpiper, Least Sandpiper, Long-billed Dowitcher, Wilson's Snipe, Wilson's Phalarope, and Red-necked Phalarope. Volunteers are encouraged to visit sites used by shorebirds on migration at least three times during each migration period (early April – mid May and mid August through late September). Twenty-five distinct or dispersed wetland sites are described. For each site, factors affecting access and detectability of birds are discussed and potential survey methods are identified. ABC incorporates important shorebird sites identified in the Intermountain West Shorebird Conservation Plan (Lahontan Valley and Humboldt WMA) and other important shorebird sites for the state (e.g. Humboldt River, Kirch WMA, Little Fish Lake). Each site is described with the following information:

- Boundaries and ownership
- Focal species using the site and timing of use
- Location of critical habitat within the site
- Access to critical habitat and visibility of the birds
- Past and current surveys
- Potential survey methods
- Pilot studies needed

This comprehensive assessment, online reporting forms and a state-wide database of survey results that is available for queries at any time can be found at www.gbbo.org/abc.



RESEARCH

Reproductive Success of Long-billed Curlews in North Ruby Valley, Nevada

Contact: Dr. Lewis W. Oring and C. Alex Hartman (Ph.D. student), Department of Natural Resources and Environmental Science, University of Nevada, Reno at 775-784-4621 or oring@cabnr.unr.edu

The Long-billed Curlew is one of the most threatened shorebirds in North America. It is categorized as "highly-imperiled" under the U.S. Shorebird Conservation Plan and is listed as a bird of conservation concern at the national level. These listings are based on substantial loss and degradation of Long-billed Curlew breeding and wintering habitat, persistent threats to remaining habitat, and a dangerously low global population estimate. Today, Nevada and Great Basin habitats are recognized as critically important to the conservation of the global population of Long-billed Curlews. Yet, quantifiable data regarding the status of Great Basin breeding populations are lacking. For this reason, we initiated a long-term study of Long-billed Curlew breeding ecology in Ruby Valley, Nevada.

Ruby Valley represents one of the densest assemblages of breeding Long-billed Curlew recorded in recent years, with densities averaging 5 pairs/100 ha in some areas. In addition, Ruby Valley exhibits two starkly different habitat types in which Long-billed Curlews nest; irrigated hayfields and dry herbaceous rangelands. Previously thought of as unsuitable or suboptimal nesting habitat, hayfields in Ruby Valley are used extensively by nesting Long-billed Curlews. Working in Ruby Valley therefore, allows for the comparison of Long-billed Curlew use and productivity within these two habitat types.

An important component of this project is the evaluation of the affects of ranching operations on Long-billed Curlew productivity. We identified and evaluated four potentially destructive factors associated with ranching operations on Ruby Valley hayfields: (1) Field-raking or the breaking up of cattle feces before the growing season which has the potential to destroy large numbers of curlew nests; (2) Trampling of nests by cattle; (3) Flooding of curlew nests by irrigation water; and (4) Mowing of flightless chicks during hay harvest. Our results show that these factors had a negligible affect on Long-billed Curlew productivity and are far outweighed by the positive value of the presence of irrigated hayfields for breeding Long-billed Curlews.

In evaluating the suitability of northeastern Nevada hayfields and adjacent rangelands as breeding habitat for Long-billed Curlew, we have measured the following in 2003-4: (1) densities of Long-billed Curlews by habitat type; (2) distributions of Long-billed Curlew nest initiation dates; (3) estimates of nest success; (4) estimates of fledging success; (5) how habitat variables affect nest and fledging success and the (6) effects of ranching operations on Long-billed Curlew productivity. Preliminary management recommendations have been made for Long-billed Curlew conservation on Nevada hayfields and adjacent rangelands, and these will be finalized following the 2005 field season. In the future, these studies will be expanded to include the study of migratory and winter ecology and behavior of individuals marked in Ruby Valley, Nevada.

Minimum Population Size of Mountain Plovers Breeding in Wyoming

Contact: Fritz Knopf, USGS – Fort Collins Science Center at 970-226-9462 or fritz_l_knopf@usgs.gov

As human disturbance of natural landscapes increases, so does the need for information on declining, threatened, and potentially threatened native species. Proposed listing of the Mountain Plover as threatened under the U.S. Endangered Species Act in 1999 was found unwarranted in 2003, but this species remains of special concern to management agencies and conservation groups. Whereas large concentrations of breeding Mountain Plovers occur in Montana and Colorado, estimates of the numbers of Mountain Plovers in Wyoming have ranged from only 500 to 1,500 individuals and are based largely on conjecture. In 2002, we visited all known breeding locales in the state to define areas of concentrated sightings in the Laramie, Shirley, Washakie, Great Divide, and Big Horn basins. In 2003, we used distance sampling to estimate breeding bird densities in these five areas. We pooled these estimates and applied the resulting density to a minimum occupied range for the Mountain Plover based on the documented sightings and a previously derived home-range size of 56.6 ha 6 21.5 (SD) to generate a minimum population estimate for the state. Average Mountain Plover density was 4.47 6 0.55 (SE) birds/km2. We calculated a minimum population estimate of 3,393 birds for Wyoming. The Mountain Plover population breeding in Wyoming appears to contribute substantially to a revised continental population estimate of 11,000 to 14,000 birds. Our approach may have applications to quantifying minimum population status of other uncommon species or species of special conservation concern using current database records, such as those compiled in Natural Heritage Programs at the state level.

Population Genetic Analysis of Mountain Plover Using Mitochondrial DNA Sequence Data

Contact: Sara Oyler-McCance, Rocky Mountain Center for Conservation Genetics and Systematics at soyler@du.edu or Fritz Knopf at USGS - Fort Collins Science Center at 970-226-9462 or fritz_l_knopf@usgs.gov

Mountain Plover distribution and abundance have been reduced drastically in the past 30 years and the conversion of shortgrass prairie to agriculture has caused breeding populations to become isolated geographically. This, coupled with the fact that Mountain Plover are thought to show fidelity to breeding grounds, leads to the prediction that the isolated breeding populations would be genetically distinct. This pattern, if observed, would have important management implications for a species at risk of extinction. Our study examined genetic variation at two mitochondrial regions for 20-30 individuals from each of four breeding locales. We found no evidence of significant population differentiation in the data from the control region or the ATPase 6/8 region. Nested clade analysis revealed no relationship between haplotype phylogeny and geography among the 47 control region haplotypes. In the ATPase 6/8 region, however, one of the two clades provided information suggesting that historically there has been continuous range expansion. Analysis of mismatch distributions and Tajima's D suggest that the species underwent a population expansion, following the Pleistocene glacial period. To explain the lack of detectable genetic differentiation among populations despite their geographic isolation and fidelity to breeding locations, we speculate that there is sufficient female-mediated gene flow to homogenize gene pools among populations. Such gene flow might ensue if pair bonds are formed in mixed flocks on wintering grounds rather than on the summer breeding grounds.

Habitat and Nesting Biology of Mountain Plovers in Wyoming

Contact: Fritz Knopf, USGS -Fort Collins Science Center at 970-226-9462 or fritz_l_knopf@usgs.gov

Although previous research has considered habitat associations and breeding biology of mountain plovers in Wyoming at discrete sites, no study has considered these attributes at a statewide scale. We located 55 mountain plover nests in 6 counties across Wyoming during 2002 and 2003. Nests occurred in 2 general habitat types: grassland and desert-shrub. Mean estimated hatch date was 26 June (n = 31) in 2002 and 21 June (n = 24) in 2003. Mean hatch date was not related to latitude or elevation. Hatch success of nests was inferred in 2003 by the presence of eggshell fragments in the nest scrape. Eggs in 14 of 22 (64%) known-fate nests hatched. All grassland sites and 90% of desert sites were host to ungulate grazers, although prairie dogs were absent at 64% of nest sites. Nest plots had less grass coverage and reduced grass height compared to random plots. More than 50% of nests occurred on elevated plateaus. The mountain plover's tendency to nest on arid, elevated plateaus further substantiates claims that the bird is also a disturbed prairie species.

High Elevation Population of Mountain Plovers in Colorado

Contact: Michael B. Wunder, Colorado Natural Heritage Program at michael.wunder@colostate.edu or Fritz Knopf, USGS – Fort Collins Science Center at 970-226-9462 or fritz_l_knopf@usgs.gov

We surveyed a discrete population of Mountain Plovers in South Park, Park County, Colorado, to determine the size and relative contribution of this geographically isolated area to the global population of plovers. First, we mapped potential plover habitat within South Park based on landform and vegetation descriptors. Second, we identified occupied habitat using observations from a systematic inventory of potential habitat from 1995-1999 and from a study of breeding biology from 2000-2002. Third, we estimated breeding densities within a framework designed specifically for distance sampling. We mapped 82,750 ha of potential habitat. We recorded 2516 plover locations from which we estimated 29,176 ha of occupied habitat. We estimated densities for 14,960 ha of potential habitat. Average plover density from 2000-2002 was 7.9±0.9 (SE) breeding adults km^{-2}, a high value compared with other sites. We calculated a population of 1187 ±140 (SE) plovers in the distance sampling area. Assuming density in our sampling area was similar for all documented occupied habitat, we estimated the population of plovers in South Park at 2310 adults. We conclude that South Park represents a contemporarily large concentration of breeding Mountain Plovers.

The Imperial Valley of California is Critical to Wintering Mountain Plovers

Contact: Michael B. Wunder, Colorado Natural Heritage Program at michael.wunder@colostate.edu or Fritz L. Knopf USGS Fort Collins Science Center at 970-226-9462 or fritz_l_knopf@usgs.gov

We surveyed Mountain Plovers wintering in the Imperial Valley of California in January 2001, and also recorded the types of crop fields used by plovers in this agricultural landscape. We tallied 4037 plovers in 36 flocks ranging in size from 4 to 596 birds. Plovers were more common on alfalfa and Bermudagrass fields than other field types. Further, most birds were on alfalfa fields that were currently being (or had recently been) grazed, primarily by domestic sheep. Plovers used Bermudagrass fields only after harvest and subsequent burning. Examination of Christmas Bird Count data from 1950–2000 indicated that the

Mountain Plover has abandoned its historical wintering areas on the coastal plains of California. Numbers in the Central Valley seem to have undergone recent declines also. We believe that the cultivated landscape of the Imperial Valley provides wintering habitats for about half of the global population of Mountain Plovers. We attribute the current importance of the Imperial Valley for Mountain Plovers to loss of native coastal and Central Valley habitats rather than to a behavioral switching of wintering areas through time. Future changes in specific cropping or management practices in the Imperial Valley will have a major impact on the conservation status of this species.

Great Basin Wetlands and Waterbirds

Contact: Susan M. Haig, USGS Forest and Rangeland Ecosystem Science Center, at 541-750-7482 or susan_haig@usgs.gov

Great Basin wetlands represent a mosaic of desert oases, with varying water compositions and quality, that provide critical habitat to millions of waterbirds throughout the annual cycle. While desert wetlands can have naturally high salinity levels, anthropogenically-increased salinization is threatening Great Basin wetlands via increased demand for freshwater for human consumption and irrigation. It also can result when adjacent riparian areas, which provide much of the freshwater to wetlands, are degraded or otherwise altered so the quality and/or quantity of water is compromised. Traditionally, great interest has been levied on western riparian areas negatively altered by logging and/or intense cattle grazing. However, there has been little, if any, recognition of the impact that this insidious degradation has on the wetlands they flow into.

Our approach to waterbird and wetland research includes a multi-scale assessment of species status and needs throughout the annual cycle focusing on the issue of wetland connectivity. In the past, this approach has been taken for forest patches and passerines, however, this spatial approach is novel for wetlands and waterbirds. In the Great Basin, we examined wetland viability and connectivity using shorebirds as vectors of wetland connectivity. By choosing focal species that had varying within- and between-season dispersal patterns, we discovered that very different conservation strategies would have to be adopted. Basic avian movement studies have now been completed and we are now testing the use of stable isotopes to track more species on a wider scale. Results will provide a test of the applicability of various metapopulation and ecoregion-level models for large-scale wetland conservation planning. Go to http://fresc.usgs.gov/staff/haig/shorebirds/ for a complete list of projects associated with this approach.

Productivity of Shorebirds Breeding Within the Greater Salt Lake Ecosystem

Contact: John F. Cavitt Ph.D., Weber State University at 801-626-6172, 801-626-8541 or jcavitt@weber.edu,

During the 2003 – 2004 breeding seasons we monitored nest-site selection and nesting success of American Avocets, Black-necked Stilt, Snowy Plover, Killdeer and Long-billed Curlew at three sites (Bear River Migratory Bird Refuge, Great Salt Lake Shorelands Preserve, and Farmington Bay Wildlife Management Area) within the Greater Salt Lake Ecosystem. Nest predation was the most significant source of nest mortality each year, followed by flooding events. Nesting success was higher at both Bear River Migratory Bird Refuge and Farmington Bay relative to Great Salt Lake Shorelands Preserve. This is likely the result of intense predator control programs in place at both Bear and Farmington. Research will continue during the 2005 breeding season with additional study sites.

Partners include Weber State University, National Science Foundation, US Fish and Wildlife Service, Utah Division of Wildlife Resources, and The Nature Conservancy.

Determining Live Capture Methods/Techniques for Migrating and Staging Marbled Godwits

Contact: Bridget Olson, Bear River Migratory Bird Refuge, at 435-723-5887 x13 or bridget_olson@fws.gov or Adrian Farmer, USGS Fort Collins Science Center at 970-226-9410 or adrian_farmer@usgs.gov

The Marbled Godwit was chosen as the focus for a recently initiated international shorebird conservation effort. At meetings in January 2002 (Sinaloa, Mexico) and August 2002 (Bismark, North Dakota), partners from U.S. Geological Survey, U.S. Fish and Wildlife Service (Prairie Pothole Joint Venture, Habitat and Population Evaluation Team), University of Montana, Canadian Wildlife Service, and Mexico (PRONATURA) began the development of a *Tri-national Marbled Godwit Initiative*. This initiative aims to intentionally take a large-scale view in developing a hemispheric conservation plan for this species. Partners recognize the Marbled Godwit as an initial 'flagship' species for shorebird conservation, similar to the way that the biological foundations for North American Waterfowl Management Plan focus on mallard production and recruitment. The number two need identified by the *Tri-National Initiative* was work in the migration corridor. Relatively little is known about Marbled Godwits during migration, especially the key stopover sites used during both spring and fall migration. Detailed work must be conducted at key stopover areas to determine parameters related to the stopover habitat quality including a) length of stay, b) body condition (i.e. fat stores), and c) rate of fat gain.

Our ability to conduct such studies is currently limited by lack of proven capture techniques at migration stopovers. Devising an effective live capture method for Marbled Godwits while they are concentrated at migration stopover sites would allow for capturing and subsequent data collection and marking of large population segments of the species. Development of capture methods would allow the scientific community to fill in information gaps on Marbled Godwit physiology and migration ecology such as length of stay, weight gain, habitat usage, determination of migration pathways, and sub-populations via genetic analysis. The primary objective of this study is to determine the most efficient and non-stress inducing live capture method(s) for Marbled Godwits. Evaluating live-capture techniques will be the focus of the work. However, we will likely capture some individual godwits, and will accomplish the following secondary objectives with captured birds:

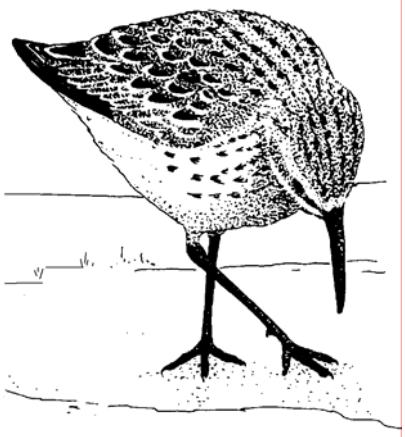
1) Estimate the body fat of captured Marbled Godwits.
2) Conduct stable isotope analysis of flight feathers collected from captured godwits.
3) Estimate the length-of-stay of selected godwits.

Development of capture methods would allow the scientific community to fill in information gaps on Marbled Godwit physiology and migration ecology such as length of stay, weight gain, habitat usage, determination of migration pathways, and determination of sub-populations via genetic analysis. This information is basic to conservation of the species so that conservation management efforts may be focused to specific areas of need and more precise population estimates may be determined to track success or failure of our efforts.

Abundance, Ecology, and Timing of Long-distance Migrant Shorebirds in Managed Wetlands at Great Salt Lake, Utah

Contact: Ann Neville, KUCC Environmental Affairs at 801-891-6842 or aneville@kennecott.com or Brian Brown SWCA at 801-322-4307 or bbrown@swca.com

We conducted systematic weekly counts of long-distance migrant shorebirds (LDMS) from April through September at Great Salt Lake, Utah, 1995-2001. Our objectives were to summarize relative abundance and species composition, identify migration chronology, document the influence of wetland enhancement and management, and determine if LDMS density under managed conditions was related to natural precipitation patterns and Great Salt Lake water levels. Sixteen LDMS species and two genera were detected, with Red-necked Phalarope (37% of total detections) and Western Sandpiper (16%) as the most abundant species. Spring migration was relatively short and peaked the first week of May, followed by a brief summer interval when LDMS were essentially absent, with a prolonged autumn migration that did not exhibit a distinct peak. Overall spring (April-May, 19.4 ± 44.6 ind./10 ha) and autumn (August-September, 7.4 ± 13.1 ind./10 ha) densities were similar. Median densities for all post-enhancement years combined (1997-2001, 12.5 ± 3.0 ind./10 ha) were greater than for pre-enhancement years combined (1995-1996, 1.2 ± 0.4 ind./10 ha). April-September LDMS mean densities by year were not correlated with precipitation totals for corresponding time intervals, suggesting that LDMS density increases were independent of local precipitation and were likely due to habitat enhancement and management. Seasonal LDMS densities exhibited no correlation with corresponding Great Salt Lake water levels. Habitat enhancement and management have the potential to benefit LDMS, particularly in the arid Great Basin of western North America, but only if appropriate information on their abundance, ecology, and timing exists as a guide.



COMMUNICATION AND COORDINATION

Linking Communities, Wetlands and Migratory Birds Project
Contact: Don S. Paul, Intermountain West Joint Venture at 801-876-3689 or avocet@qwest.net , Yaeko Bryner, Environmental Educator, ybryner@earthlink.net

An initiative to conserve migratory shorebirds in the Western Hemisphere has been developing over the last two decades. The concept is to identify and recognize the importance of significant migratory shorebird stopover sites. To do this the Western Hemisphere Shorebird Reserve Network (WHSRN) program was developed and put in place. In 1998 three of these WHSRN sites that share the same species of shorebirds along the migratory pathway were networked through a conservation linkage. These sites are the Chaplin Lake area of Saskatchewan, the Great Salt Lake (GSL) of Utah and the Marismas Nacionales complex of Nayarit. A Commission for Environmental Concern Grant administered through Wetlands International in cooperation with Saskatchewan Wetlands Conservation Corporation, Utah Division of Wildlife Resources and Wetlands International Mexico assisted by SIMERNAP (Nayarit) funded the initial Linking effort. The program is known as the Linking Communities, Wetlands and Migratory Birds Program (Linking). Since its inception Linking has worked through local partnerships in the three countries to carry out conservation activities. The primary emphases have been on shared formal education through the Shorebird Sister Schools Program (SSSP), developing ecotourism partnerships and collective science and habitat conservation information. Just as important as the projects to the success of Linking are the working relationships and shared vision of the partners. A broader conservation perspective has developed with new partnerships, but migratory bird conservation remains the primary emphases.

Highlights of this project include:
- Linking meeting in Tepic, Nayarit Mexico sponsored by SIMERNAP 1999. At this meeting the three countries fleshed out three international objectives, their focus is education, conservation based tourism, and communications.
- Linking Conservation Based Tourism Test Group Tour co-sponsored by US, Canadian and Nayarit officials 2000
- Linking meeting in Salt Lake City, Utah hosted and sponsored by Utah Linking Project Committee. At this meeting we developed work plans for the three objectives developed at the 1999 meeting in Tepic

Accomplishments include:
- A North American Guide Exchange which included Linking representatives from each country in 2001
- An International SSSP training workshop in Salt Lake City in 2001
- Funding for Yuri Blanco, Mexico SSSP Coordinator to work with schools in the Nayarit area to sure up links with Utah and Chaplin schools.
- The formation of SSSP relationships between schools in Mexico (Pimientillo and Villa Hildalgo) and Utah Wasatch Elementary. This built upon some existing school interaction started in 1999.
- A Linking Fun Run and Bike Ride sponsored by the GSL Bird Festival to raise funds for Linking projects especially for Mexico contacts.
- The development of a business plan draft proposal to investigate the linking of conservation based tourism between linked sites.
- Fund drive in Utah through the GSL Bird Festival to assist with conservation recovery after Hurricane Kenna especially for Linking affected projects and to bolster the SSSP.

- January 2004 a contingency of Utah Linking partners meet with Nayarit Linking partners to work on SSSP relationships, shared ideas on strengthening bird festival partnerships, and an approach to funding and establishing conservation partnerships. We discussed and visited Hurricane Kenna damaged habitats and reviewed recovery efforts and subsequent conservation actions. We attended the Villa Hildalgo sponsored Marismas Nacionales first Annual Bird Festival and presented $1,800. from the GSL Bird Festival for the reconstruction of a bird viewing tower and for the SSSP program in Nayarit.
- Utah Linking partners hosted three Mexican partners in a visit to Utah to work on educational and bird festival linkages between the two sites during the GSL Bird Festival in May 2004. Agreements were made and details established to increase the number of schools and/or classrooms in Utah and Nayarit that would share in the SSSP program beginning in November 2004.
- Recently Utah Linking partners have established and strengthened relationships with Nayarit State sustainable resource officials, Conservation International, The Under Secretary of Tourism in Nayarit, the town officials of Singayta, Pimientillo, Mexcaltitan, and Villa Hildalgo. We are exploring the potential conservation relationship between the US/ Canada and Mexican Important Bird Area program (IBA/ AICA) in relevant Communities of each Mexico and Utah that share the Linking vision. Carlos Villar, SEMARNAP, Guadalupe Velazquez environmental educator, Abel Castillo, Principal are working to expand the SSSP training in Nayarit especially in the Linking focus area of Marismas Nacionales. At the same time Yaeko Bryner, environmental educator and other educators are expanding the SSSP training in Utah.

Nevada's Birding Outreach Efforts

Contact: Rick Gray, Fallon Convention and Tourism Authority at falntour@phonewave.net or 1-866-4fallon or Janet Schmidt, Stillwater NWR at 775-428-6452 or janet_schmidt@fws.gov

The Fallon Convention and Tourism Authority recently completed an assessment of wildlife tourism in the greater Reno, Nevada region. This assessment considered different types of travelers, their origins, reasons for visiting, missing marketing links, the best spots to bird in Nevada, and species assemblages. They found that most visitors traveled to Nevada for wildlife tourism from California. However, serious birders were not visiting Nevada even though wildlife viewing ranked 8th among outdoor recreation activities. Their analysis revealed that the lack of marketing for wildlife tourism in Nevada was the limiting factor. Based on expansive literature reviews, web site reviews, and over 100 interviews, they identified 12 top destinations to target marketing towards wildlife enthusiasts including Carson Lake, Stillwater National Wildlife Refuge, and Pyramid Lake. Known shorebird concentrations during spring and fall as well as the Spring Wings Festival and Nevada Birding Map were identified as primary factors that draw visitors to Nevada.

The annual Spring Wings Bird Festival coincides with the height of spring migration in the Lahontan Valley wetlands. These internationally recognized wetlands are temporary home to over 260 species of birds, including thousands of Long-billed Dowitcher, Black-necked stilts, American avocets, and many other waterfowl and waterbirds. The theme for Spring Wings 2005 was "Kids and Nature" with increased the activities for kids of all ages. Field trips visited birding hotspots in the area including Carson Lake, Stillwater NWR and Pyramid Lake. For more information, go to http://www.springwings.org/.

The Nevada Birding Map was produced by the Lahontan Audubon Society. It features over 80 great birding spots in Nevada and provides directions to each site, brief descriptions of the habitats and birds associated with each location, facilities and accessibility, global positioning system coordinates, and more. It is available online at http://www.nevadaaudubon.org/Bookstore/bookstore.html.

USFWS Outreach Activities with Shorebird Sister Schools
Contact: Suzanne Fellows, USFWS – Migratory Birds and State Programs, Region 6 at 303-236-4417 or suzanne_fellows@fws.gov or Sue Thomas, USFWS – Migratory Birds and Habitat Programs, Region 1 at 503-231-6164 or sue_thomas@fws.gov

The Shorebird Sister Schools Program (SSSP) is an international partnership effort developed to encourage the conservation of wetland habitats and the shorebirds that depend on them. SSSP is an internet-based environmental education program that connects students, educators, biologists, and birding enthusiasts along migratory flyways. The program includes three key components: K-12 curriculum, web site and e-mail network. Students learn about their local ecosystems by observing and learning about shorebirds, then connect with biologists, bird enthusiasts, and other students tracking shorebird migration via a list server and web site.

SSSP is growing in the Intermountain West with partners spending thousands of hours and dollars on educator workshops, formal and non formal classroom activities, and developing new educational resources for the classroom each year. Primary partners include USFWS Migratory Birds and Habitat Programs and National Wildlife Refuges divisions in Regions 1, 6 and 2, Americorps, and several nature centers. Currently there are several permanently stationed Shorebird Education Kits available in the Intermountain West Shorebird Region. Key activities include:

- Production and release of the new curriculum, "Explore the World with Shorebirds" covering all shorebird flyways in the United States.
- Production of Shorebird Identification Flashcards with an emphasis on Pacific Flyway shorebirds. These life-sized, color illustrations will feature key identification points in Spanish and English. Once completed, the flashcards will be available online and in the Shorebird Education kits.
- The U.S. Fish and Wildlife Service hosted an "electronic field trip" involving approximately 3000 students from grades 4-10. The field trip was designed to teach students how to identify shorebirds of the Pacific Flyway.
- Linking communities effort to build stronger ties between key shorebird sites in Canada, the U.S., and Mexico (see summary in this section).

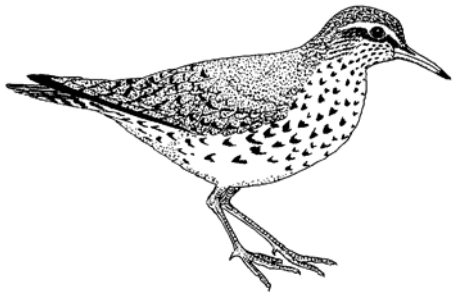
Shorebird Sister Schools Program and Associated Conservation Activities in Utah
Contact: Don S. Paul, Intermountain West Joint Venture at 801-876-3689 or avocet@qwest.net , Yaeko Bryner, Environmental Educator, ybryner@earthlink.net

The emphases to activate the Shorebird Sister School Program (SSSP) in Utah came from international involvement with two other WHSRN sites through the Linking Communities, Wetlands and Migratory Birds Initiative described further in this document. The Linking partners in the three countries agreed to work together through environmental education at a Linking Meeting in Tepic, Nayarit Mexico sponsored by SIMERNAP 1999. The SSSP was chosen as a primary tool for education delivery.

An International SSSP training workshop was held in Salt Lake City in 2001. A small fund was provided to Yuri Blanco, Mexico SSSP Coordinator to work with schools in the Nayarit area to sure up links with Utah and Chaplin schools. A Nayarit workshop for teachers was conducted by Yuri and Carlos Villar in 2002. The formation of SSSP relationships between schools in Mexico (Pimientillo and Villa Hildalgo) and Utah Wasatch Elementary was created. This built upon some existing school interaction started in 1999. Now there are several Utah schools involved.

A Linking Fun Run and Bike Ride sponsored by the GSL Bird Festival to raise funds for Linking projects especially for Mexico and to assist the SSSP was held in 2002-03. Funds were delivered to Mexican SSSP partners to assist with conservation recovery after Hurricane Kenna especially for Linking affected projects and to bolster the SSSP. In January 2004 a contingency of Utah Linking partners meet with Nayarit Linking partners to work on SSSP relationships, shared ideas on strengthening bird festival partnerships, and an approach to funding and establishing conservation partnerships. We discussed and visited Hurricane Kenna damaged habitats and reviewed recovery efforts and subsequent conservation actions. We attended the Villa Hildalgo School sponsored Marismas Nacionales first Annual Bird Festival and presented $1,800. from the GSL Bird Festival for the reconstruction of a bird viewing tower and for the SSSP program in Nayarit. This program is gaining momentum and continues to grow; we are now looking toward teacher exchanges and shared classroom projects.

Another success has been the establishment of two bird festivals that grew from Linking. The Great Salt Lake Bird Festival is now in its eighth year and the Nayarit, Mexico Bird Festival, developed from the Great Salt Lake festival, is hosting its second festival in January 2006. These two festivals and their organizers are working together to tell the international story of shared shorebirds and other migratory species. One of the primary goals of these festivals is to provide school children and families an opportunity to learn about shorebirds, conservation and to share artwork and classroom activities. The GSL Bird Festival hosts a student day and a shorebird teacher workshop.



PLANNING

Bear River Migratory Bird Refuge All-Bird Habitat Management Planning
Contact: Bridget Olson, Bear River Migratory Bird Refuge at 435-723-5887 ext. 13 or bridget_olson@fws.gov

In April, 2004, Bear River Migratory Bird Refuge staff completed the "Bear River Migratory Bird Refuge Habitat Management Plan." The Bear River Habitat Management Plan (HMP) is the first such approved document written in accordance with new refuge policy that provides guidelines on how to derive habitat goals, objectives and management strategies that reflect a refuge's role in the larger landscape while achieving an individual refuge's specific purposes.

Habitat management planning is a step-by-step process. Ecological data at the broad ecosystem level are "stepped down" to the local level of the refuge. Refuge habitats are described in the context of the surrounding landscape as well as the associated biotic and abiotic forces that drive ecosystem processes. Habitat management planning is also a focused process to evaluate the most appropriate management direction or best use of refuge lands. For Bear River Refuge, that meant considering the refuge's role in addressing conservation issues in the Intermountain West, Great Basin, and Great Salt Lake ecosystems.

Effective and efficient management of natural resources means knowing the species and habitats most in need of conservation efforts. Therefore, one of the most important steps is identification of refuge resources of concern – those species, groups or communities upon which to focus management. To identify resources of concern, Bear River Refuge staff assembled landscape-scale bird conservation plans, such as the U.S. Shorebird and Waterbird Conservation Plans, stepped down to Intermountain West regional plans, then to the Great Salt Lake basin and finally to the refuge. In this final step, we considered the historic, current, and potential ability of the refuge to contribute toward the conservation of species and/or species habitat. Species were flagged as refuge priority when the refuge played an obvious role in population and habitat objectives as outlined in one or more bird conservation plans.

Sixteen avian species and species groups were identified and ranked as Refuge resources of concern. Of those sixteen, half are shorebirds (Table 1).

Table 1. Bear River Migratory Bird Refuge priority shorebird species and ranking factors.

Refuge Rank	Species	Ranking Factors
1	American Avocet	Refuge as part of Great Salt Lake hosts up to 14% of continental breeding population and 55% of continental population during migration.
3	Black-necked Stilt	Refuge as part of GSL hosts 79% of Intermountain West migration population. Refuge hosts 2% of continental breeding population.
5	Migrant Shorebirds	Refuge as part of GSL recognized as WHSRN Hemispheric Site. Refuge hosts average spring pop. of 18,000 shorebirds and average fall population of 69,000.
8	Snowy Plover	Refuge as part of GSL host > 50% of continental breeding population of interior species.
9	Marbled Godwit	Refuge and GSL host up to 86% of IMW migration

		population. Refuge as part of GSL, only known inland staging area in North America. Refuge peak of 30,000 is 15-21% of continental population.
10	Long-billed Curlew	Refuge historic records of 50 breeding pair indicative of important breeding area in IMW.
13	Wilson's Phalarope	GSL recognized as largest staging area in the world.
14	Long-billed Dowitcher	The Refuge as part of GSL host 39% of IMW population during migration or 3% of the continental population.

Managing by the Plan
The HMP provides consistency in long-term management, while the Annual HMP sets a course of action at the beginning of each season. Refuge staff derived habitat objectives by linking the ecological and physical aspects of refuge lands with priority species habitat requirements. The objectives concisely state the habitat conditions needed for the resources of concern. Finally, Refuge staff used ecological data, scientific literature, expert opinion, key historical refuge data, and staff expertise to generate a list of potential management strategies for each habitat type. The most appropriate management strategy from this list, is selected each year in the spring during the annual habitat management planning process. Our strategy selection is based on the effects of management actions on the habitat and species of concern from the previous year, as captured through monitoring, as well as predicted water supply from the Bear River. For example, Refuge staff may determine the most appropriate management action, in years with limited water supply, is to keep water at target levels in wetland units that support the highest ranked species.

The process becomes evident on the ground. To manage wetlands, for example, the refuge will work to maintain a diversity of wetland types with a range of water depths, to influence the aquatic vegetation community composition. The work is complex as refuge staff implement three primary water management strategies that influence soil salinity and clarity levels that lead to the desired mix of wetland types.

The Bear River Migratory Bird Refuge Habitat Management Plan has brought home the importance of managing the refuge as a functioning wetland system in light of the paucity of freshwater wetlands in the Great Basin and the Great Salt Lake ecosystem. The HMP describes a wetland network of braided river channels, deep pockets of open marsh, and shallow waters hosting an assortment of vegetation. In the final analysis, the HMP articulates how to manipulate wetland habitats to mimic, as closely as possible, the historic and natural hydrologic processes of the Bear River delta that enables a plethora of bird species to flourish. To download the HMP and annual HMP, go to http://bearriver.fws.gov/.

Comprehensive Wildlife Conservation Strategies

See State Contacts Below

Congress created two non-regulatory grant programs to provide funding to states for proactive wildlife conservation efforts that will help states avoid expensive and potentially controversial measures for species conservation. In order to make the best use of the State Wildlife Grants program, Congress charged each state and territory with developing a statewide Comprehensive Wildlife Conservation Strategy (CWCS). These strategies will provide an essential foundation for the future of wildlife conservation and a stimulus to engage the states, federal agencies and other conservation partners to strategically think about their individual and coordinated roles in prioritizing conservation efforts in each state and territory.

Each CWCS must contain eight required elements:

- Identify species of greatest conservation need
- Identify habitats of greatest conservation need
- Describe the threats or problems facing these species and habitats
- Describe priority research and survey efforts needed to identify factors to assist in their restoration
- Describe needed conservation actions
- Develop procedures to review the Strategy at regular intervals
- Suggest monitoring plans for issues identified to be of conservation concern
- Document that meaningful opportunities for public participation have been provided during development and implementation of the plan

Further, the strategies must identify and be focused on the "species in greatest need of conservation," yet address the "full array of wildlife" and wildlife-related issues. Each state must submit their CWCS to the USFWS by 1 October 2005 in order to qualify for grants under this program. Opportunities will be provided for public involvement during development of the CWCS. For more information on these Plans, go to http://www.teaming.com/state_wildlife_strategies.htm.

Nevada's Comprehensive Wildlife Conservation Strategy

Contact: Larry Neel, Nevada Department of Wildlife at 775-688-1525 or neel@ndow.state.nv.us

The Nevada Department of Wildlife is now working to create a 10-year wildlife conservation plan, the Comprehensive Wildlife Conservation Strategy (CWCS). The CWCS will focus on the species and habitats in greatest need of conservation in Nevada. Existing information such as the Intermountain West Regional Shorebird Conservation Plan has been used in drafting the CWCS. Of the shorebirds that occur in Nevada, Western Snowy Plover, Black-necked Stilt, American Avocet, Willet, Long-billed Curlew, Least Sandpiper, Long-billed Dowitcher, and Red-necked Phalarope are priority species in which management plans will be developed either for a species group or individually. Black-bellied Plover, Greater Yellowlegs, Spotted Sandpiper, Marbled Godwit, Western Sandpiper, and Dunlin are designated as stewardship species for which management of priority species should conserve their habitats as well. Priority habitats for shorebirds include riparian wetlands, aquatics, and agricultural lands that support shorebirds during some phase of their life cycle. SW Regap formed the basis for identifying priority habitats and conservation planning in the CWCS. Priority monitoring efforts to date include Nevada's Aquatic Bird Count (described further in this report) a volunteer-base survey for aquatic species including shorebirds.

The Intermountain West Shorebird Working Group is asked to provide current input that may not be covered in the Regional Shorebird Conservation Plan to assure current issues and priority species needs are addressed. Input from the public, conservation partners and stakeholders, universities, state and federal agencies will also be incorporated into the planning process. For more information, go to www.ndow.org/wild/conservation/cwcs/.

California's Comprehensive Wildlife Conservation Strategy
Contact: Dale Steele, California Department of Fish and Game at 916-653-3444 or dsteele@dfg.ca.gov

California Department of Fish and Game (Department) is currently developing their Comprehensive Wildlife Conservation Plan (CWCS). The CWCS will address the broad range of wildlife and associated habitats, with emphasis on those species of greatest conservation need. It will integrate regional conservation plans such as the Intermountain West Shorebird Conservation Plan and existing data or programs such as the Natural Diversity Data Base and the Significant Natural Areas Program among others. The Department will then develop strategies and priorities to provide direction for conservation activities in the future and as funding becomes available. This living document will be periodically reviewed and updated to incorporate the addition of new species, habitat information, conservation plans and actions, and the results of conservation activities that were previously conducted.

The Department has identified important bioregions throughout the state as well. Within each bioregion, important species, core areas and corridors of habitats have been identified. For instance, important shorebird species in eastern California include Long-billed Curlew and Mountain Plover. This information will be integral to the development and implementation of regional multi-species conservation plans. Each regional plan will meet the following objectives:

- Identify wildlife habitat core areas and corridors, to be managed primarily for wildlife values.
- Describe landscape treatments and restoration strategies beneficial to wildlife diversity and ecosystem health.
- Prioritize habitat restoration projects for each of the plant communities and ecosystems of the region.
- Prepare implementation plans and schedule.
- Identify and secure funding to implement the regional multi-species conservation plan.
- Protect and recover threatened and endangered species.
- Protect and enhance ecosystems important for sustaining rich wildlife diversity.

Interior Shorebirds in Oregon's Comprehensive Wildlife Conservation Strategy
Contact: Holly Michael, Oregon Department of Fish and Wildlife at Holly.B.Michael@state.or.us or 503-947-6321

Please note that Oregon's Comprehensive Wildlife Conservation Strategy (Strategy) is in draft form, so the following information may change as further public review and input are obtained. The Strategy will outline how and where the state and its conservation partners can work to conserve the state's natural resources. The Strategy should provide the following benefits:

- Provides a common conservation vision that will guide the state in improving the prospects for effective coordination and fewer conflicts.
- Will allow existing land and resource management and conservation needs to be put into a broader context, providing recognition for the contributions that landowners and land managers are already making towards a long-term conservation strategy.
- Will ensure that limited conservation resources can be used more effectively by identifying areas where conservation activities will provide the greatest benefit:
    - Conservation actions can be more proactive and less reactive

    - Conservation actions of agencies, landowners, interest groups, conservation organizations and others can be coordinated so that they are more cost-effective and produce long-term cumulative benefits
    - These actions can be collaborative processes focused on priority conservation needs and objectives
    - Landowners and local conservation groups will be able to see how local conservation actions fit into a broader regional or statewide perspective
- Will facilitate existing programs that offer incentives to private landowners for voluntary actions to conserve natural resources on private lands to be used more effectively.
- Reduces the risk of further threatened and endangered species listings that would impose additional regulatory burdens on Oregon's businesses and industries.
- Synthesizes reliable, science-based, peer-reviewed data to provide a "big picture" view (ecoregional and statewide) of Oregon's natural resources.
- Maintain Oregon's reputation for a high quality of life and preservation of natural resources, which is one of the state's core strengths in attracting businesses.
- Contribute to the diversity and productivity of natural resources and the high quality of life in Oregon:
    - High quality of life is one of the state's core strengths in attracting businesses.
    - Diversity and productivity of natural resources contributes to Oregon's reputation as a desirable tourist destination.
- Ensure Oregon's eligibility for future conservation funds from State Wildlife Grants or CARA funds will be maintained.

Oregon's Strategy takes a "coarse filter/fine filter" approach to conservation planning. Strategy Habitats are considered "coarse filters" in that they contain many species and their conservation benefits other species associated these habitats. Coarse-filter habitats are inadequate to address the conservation needs of all species of concern, particularly those that may be dependent on multiple habitats at different times during their life-cycle, occur in a very narrow habitat type or small geographic area, or travel across a large geographic area. Strategy Species are the "fine filter" intended to capture the conservation needs of declining species that aren't well-represented by Strategy Habitats.

Several proposed Strategy Habitats are important for migrating and breeding shorebirds in eastern Oregon. These include: wetlands (all ecoregions, includes wet meadows), Aquatic (all ecoregions), and Grasslands (Columbia Plateau and Blue Mountains ecoregions). Proposed shorebird Strategy Species for eastern Oregon include Upland Sandpiper, Western Snowy Plover, Black-necked Stilt, and Long-billed Curlew.

The Strategy has built upon many previous local, state and regional planning efforts, including bird conservation plans, Sub-basin Plans, the Oregon Biodiversity Project, and the Interior Columbia Basin Ecosystem Management Project. The Intermountain West Shorebird Conservation Plan and Eastern Oregon All-Bird Plan helped inform decisions on focal species in the eastern portion of the state. Also, Important Bird Areas and Oregon Habitat Joint Venture priority areas are two of the many factors going into the GIS-based analysis to determine Conservation Opportunity Areas (COAs). COAs are spatial recommendations for priority landscapes in which to implement conservation actions.

Intermountain West Joint Venture Coordinated Implementation Plan for Bird Conservation

Contact: Jim Cole, Intermountain West Joint Venture at 801-975-3330 x129 or jim@iwjv.org or Sam Lawry, Intermountain West Joint Venture at 602-789-3279 or sam@iwjv.org

The mission of the IWJV is to provide for partner assistance with long-term conservation of priority avian habitats. The guiding principles of the Joint Venture operation are to apply a voluntary and non-regulatory approach to partnership building. The IWJV was initially formed in 1994 with a focus on wetlands and waterfowl. In 1999, the Management Board expanded the mission of the Joint Venture to include conservation actions for all bird habitats within the IWJV boundary. Well over 360 Joint Venture partners have come together to accomplish bird conservation in the first ten years of the Joint Venture's existence. To date, these partners have collaborated to conserve more than 430,000 acres of avian habitat. Non-federal partners have contributed more than $75 million to match $58 million from federal partners on bird conservation in the last decade.

The IWJV recently released a 10-year implementation plan for all bird conservation. The plan outlines the focus for IWJV projects in the next decade. The planning area encompasses much of the Intermountain West, from Canada to Mexico, the Rocky Mountains to the Cascades and the Sierras. This extensive geographic region encompasses portions of eleven western states and includes an enormous diversity of avian habitat. The plan coordinates the needs of all priority birds in the IWJV. Our planning focal points are key geographies where priority birds and priority habitats come together. These focal points are called Bird Habitat Conservation Areas (BHCA). Conservation projects will be generated within these areas. Partners used existing data, such as the Intermountain West Shorebird Conservation Plan, to focus conservation efforts on priority habitats. The plan has two key components: 11 State Coordinated Bird Habitat Conservation Plans and GIS mapping and analysis products.

We estimate approximately 500 avian species occur in the IWJV. A total of 87 species are considered continentally important in the Joint Venture. Continentally important shorebirds include: Snowy Plover, Black-necked Stilt, American Avocet, Spotted Sandpiper, Whimbrel, Long-billed Curlew, Willett, Western Sandpiper, Least Sandpiper, Long-billed Dowitcher, Wilson's Phalarope, and Red-necked Phalarope. An additional 181 bird species that have been identified by partners as regionally important. Both continentally and regionally important species were selected because they (1) are at risk or are in serious decline, (2) the most significant population of the species resides in Intermountain West biomes, or (3) have socio-economic importance.

Nearly 510 million acres of habitat occurs within the IWJV. Of that total, 77.0 million acres of Priority A habitats and 46.9 million acres of Priority B habitats were identified by state partners as the locations where bird conservation should happen in the next decade. Priority A habitats for shorebirds include Aquatic/Wetland, Grassland, and Riparian habitats. Priority B habitats for shorebirds include Agricultural habitats. These habitats occur in the BHCAs that are designated as key geographies for conservation by state partners.

To see how the IWJV Plan will be implemented from the ground-up, see the summary for Utah's Coordinated Implementation Plan in this section. To download a copy of individual state plans, go to http://iwjv.org/plans.htm.

Coordinated Implementation Plan for Bird Conservation in Utah
Contact: Wayne Martinson, Utah IBA Coordinator, at wmartinson@audubon.org

In 2000, the Intermountain West Joint Venture (IWJV) Management Board determined that the 1995 IWJV Implementation Plan should be updated, as a Strategic Plan, and that it should be rewritten from the ground up, state-by-state. The Board also decided that this updated planning process should attempt to coordinate NAWMP and joint venture objectives with other bird initiatives operating within the Intermountain West region including the Intermountain West Regional Shorebird Plan (IWRSP). That same year, the Board funded a project to work with state steering committees in developing coordinated "all bird" implementation plans for all the states of the Intermountain West Joint Venture. The Utah Steering Committee has met on a number of occasions in 2001, 2002 and 2003 to develop a state implementation plan.

The coordinated "all bird" implementation plan for Utah not only contributes to an updated and expanded overall IWJV Implementation Plan, but will also assist the IWJV Management Board in considering and ranking various habitat protection, restoration and enhancement projects for funding via the North American Wetlands Conservation Act and other programs.

Planning objectives for Utah include:

- Create a planning forum, through the Utah Steering Committee of the IWJV in which representatives of state and federal conservation agencies and wildlife conservation groups work collaboratively to develop coordinated habitat goals, objectives and projects that address the conservation needs of all bird species in Utah.
- Review, merge and synthesize the habitat goals and objectives of existing bird conservation plans into a coordinated planning document that reflects the habitat priorities of all bird conservation programs in Utah. This document is intended to guide the Management Board of the Intermountain West Joint Venture (IWJV), as well as IWJV partners, in updating and implementing habitat goals and objectives for future bird conservation in Utah.

The IWRSP notes that perhaps a million shorebirds breed in the Intermountain West and that millions more migrate through the area each year. The IWRSP recognizes that finding ample high quality fresh water will be the greatest challenge faced by shorebirds in the Intermountain West. It articulates seven goals and associated objectives and strategies related to habitat management, monitoring and assessment, research, outreach and planning. The planning goal includes objectives to coordinate shorebird planning and projects with other migratory bird initiatives and specifically with the Intermountain West Joint Venture. It further identifies eleven species of shorebirds that regularly breed in the region, as well as 23 additional species that are annual migrants. The IWRSP also recognizes eleven Key Shorebird Areas, one of which, Great Salt Lake, is in Utah.

Eighteen priority shorebird species in Utah are listed and ranked. Species with a score of 1 are ranked Critically Important; those with a score of 2 are ranked Very Important; those with a score of 3 are ranked Important. Great Salt Lake is classified as an International Site under the Western Hemisphere Shorebird Reserve Network (WHSRN). The IWRSP, provides the primary source of information for shorebird species and habitat objectives for the coordinated implementation plan for bird conservation in Utah. Shorebird species and other priority bird species are shown within their associated critical habitats in an appendix in the Plan. A copy of the plan can be found online at http://iwjv.org/plans.htm

WHSRN Sites Within the Intermountain West

Contact: Charles Duncan, Coordinating Office – WHSRN at 207-871-9295 or cduncan@manomet.org

The Western Hemisphere Shorebird Reserve Network (WHSRN) was established in 1985 as biologists became increasingly aware of the critical role of migratory staging and stopover sites for shorebirds. Today the Network comprises approximately 60 sites in 7 countries. The network's mission is to conserve shorebird species and their habitats across the Americas through a network of key sites. These sites are ranked using scientifically based criteria by magnitude of use throughout the year. The three categories of significance include "hemispheric" (used by over 500,000 shorebirds/yr or greater than 30% of a flyway population), "international" (>100,000/yr or >10%) or "regional" (>20,000/yr, or at least 5%). Current WHSRN sites in the Intermountain West include:

- Great Salt Lake, UT (Hemispheric)
- Lahontan Valley, NV (H)
- Mono Lake, CA (International)
- Springfield Bottoms/American Falls Reservoir, ID (Regional)
- Salton Sea, CA (R)

Known potential sites and their designations include:

- Lake Albert, OR (I)
- Harney Basin, OR (R)
- Summer Lake, OR (R)
- Warner Wetlands, OR (R)
- Alkali Lakes, CA (R)
- Goose Lake, OR, CA (R)
- Honey Lake, CA (R)
- Humboldt WMA, NV (R)
- Klamath Basin OR, CA (R)
- Lake Lowell, ID (R)
- Owens Lake, CA (R)
- Utah Lake, UT (R)

Recently, WHSRN completed a 5-year strategy including a thorough review of the Network's mission, conservation vision, and structure. To accomplish WHSRN's mission, we have identified several goals and objectives that will form the basis of the Network's activities over the coming five years. The four goals are to:

1) ensure that the Network's conservation actions are the effective and appropriate application of the best available information;
2) implement shorebird conservation action at Network sites throughout the Americas;
3) create and maintain informed, involved, empowered and interconnected human communities at Network sites; and
4) become the strongest network of sites possible.

Key objectives include:

- Develop and implement conservation strategies (management plans) for important shorebird species at all Network sites to abate threats to these species, with special emphasis on multi-site strategies
- Review Network site criteria including development of categories for dispersed species

- Expand the Network of member sites to include all staging, stopover and wintering sites meeting the criteria
- Provide all communications in Spanish as well as English

Related to these objectives, WHSRN is undertaking two significant conservation planning activities with funding from the National Fish & Wildlife Foundation. The first is to design site-base conservation for the most at-risk shorebird species. This will be done through species-specific working groups enumerating sites of known importance and priority management activities even as the slower work of identifying new sites and an overarching conservation strategy proceeds.

A parallel project is to identify the threats at existing WHSRN sites that affect shorebirds and their habitats using a methodology that allows comparison of sites and identification of multi-site and multi-scale threats. This analysis will then be used to design conservation strategies to abate the threats and measure the adequacy of conservation actions undertaken in response.

While the sites are the backbone of WHSRN, three groups are critical for the implementation of this five-year strategy, as well as future plans. These are Site Partners - the people on the ground at each WHSRN site such as landowners and friends groups; Network Partners - the organizations that support the Site Partners and the Network overall including shorebird working groups, agencies, universities, businesses and related consortia, and the Advisory Committees - such as the US WHSRN National Council composed of members of the US Shorebird Council's Executive Committee. WHSRN is currently developing a GIS database of network sites that includes shorebird use, ownership, and contacts covering these three groups. Please contact me if you are interested in becoming a partner for one of our current sites.

Finally, the network is collecting ideas for conservation related projects for both current WHSRN sites and new places that may qualify. We maintain these in an "idea bank" of projects, and use them to help think about conservation strategies and the fundraising needed to support these activities. The most appropriate projects in this regard are those that address threats to shorebirds of high conservation concern that may link sites and/or where an action at one site helps others in the Network. We have typically had better success with conservation projects than with monitoring or pure research. We are not looking for anything formal or long, just ideas. We need only two or three paragraphs explaining how the project will address threats to habitats or shorebirds to begin with. Please indicate what shorebird species be they resident or migrant, will benefit.

Please contact me if you have ideas on how to incorporate dispersed species considerations, dispersed site needs or project proposals that involve sites or potential sites in the Network. We are always interested in learning about sites that meet WHSRN criteria and individuals or organizations that are interested in becoming members or partners in shorebird conservation.

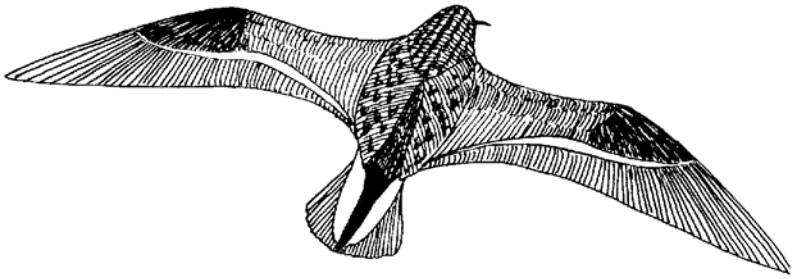
A Plan for Monitoring Shorebirds during the Non-breeding Season in Region Utah-BCR 9
Contact: Ann Manning, Great Salt Lake Ecosystem Project, or Jon Bart, USGS, at 208-426-5216 or jon_bart@usgs.gov, or John Luft, Great Salt Lake Ecosystem Project at 801-537-3342 johnluft@utah.gov, or Don Paul, BCR 9 Coordinator, at 801-876-3689 avocet@qwest.net

This monitoring plan is designed to provide good estimates of the average number of shorebirds present during the non-breeding season in the Great Basin region of Utah. These estimates will be used to analyze trends in populations of individual species of shorebirds. Most of the document focuses on

sampling plans for obtaining average estimates of shorebirds using ground surveys. A few species (i.e. American Avocets, Black-necked Stilts, Wilson's Phalaropes and Red-necked Phalaropes) are difficult to survey accurately from the ground and separate surveys are discussed for these exceptions at the end of the document. To facilitate planning, Shorebird Conservation Region Utah –BCR 9 has been divided into nine domains. Each domain is divided into one or more strata, which are the sampling units for these surveys. Habitat in each stratum is classified based on the amount of shorebird use. Habitat of little to no shorebird use (Type 3 habitat) will not be surveyed, unless casual observation suggests shorebirds are using these areas in moderate numbers. Areas with moderate use are classified as Type 2 habitat. Periodic, flexible surveys are recommended for these areas, primarily to verify that only a small proportion of the population uses these areas. More detailed and comprehensive surveys are recommended for habitat with substantial shorebird use (Type 1 habitat). Data collected from these surveys will be used in the trend analyses of shorebird populations. Out of 51 strata, 20 include some Type 1 habitat. Of these, 10 strata require additional information or a pilot study before survey recommendations can be made. In the other 10 strata, complete counts of shorebirds are possible in all Type 1 habitat.

This plan is a collaborative effort among local, regional, and national biologists. Local biologists have been particularly important by providing habitat information and survey recommendations. Implementation of this monitoring plan relies on their continued support and involvement.

The monitoring plan for the northern portion of this Region was designed using the knowledge gained during the Great Salt Lake Waterbird survey. Three separate surveys are suggested: (1) ground-based counts for all species, (2) aerial surveys for avocets and black-necked stilt, (3) a survey for phalaropes using methods still to be determined. The reasons for separate counts of avocets, stilts, and phalaropes are that these species often occur in extremely large numbers (individual flocks with tens of thousands of birds) which are difficult to count accurately from the ground and are present too far from land to be counted accurately by ground-based surveyors. In this document, we assume that avocets and stilts will be counted on ground counts and that aerial surveys will not cover selected areas that are well enough covered from the ground. Phalaropes are less likely to be covered to any significant extent on the ground-based counts because they are much more abundant in the open water portions of the Great Salt Lake. Most of the document is focused on the ground surveys, but short sections suggesting needed development work on the other two surveys are included at the end of the report. Examples of this document can be found online at http://wss.wr.usgs.gov/project/site_browse.html



PROJECTS BY STATE

Arizona

California
Changes in Numbers of Nesting Snowy Plovers at Owens Lake
California's Comprehensive Wildlife Conservation Strategy
The Imperial Valley of California is Critical to Wintering Mountain Plovers

Colorado
Browns Park NWR Moist Soil Management
Monitoring Colorado's Birds
High Elevation Population of Mountain Plovers in Colorado

Idaho
Wetland Creation for Shorebirds at Kootenai NWR
Foster Slough Wetlands Complex Protection, Restoration/Enhancement and Management
Six Springs Ranch Moist Soil Unit and Waterbird Management Project
Sundown Ranch Waterbird Conservation and Restoration
Shorebird Use and Habitat Management on Camas NWR
Idaho Bird Inventory and Survey

Montana

Nevada
Ruby Lake NWR Habitat Improvements
Nevada's Aquatic Bird Count
Reproductive Success of Long-billed Curlews in North Ruby Valley, Nevada
Nevada's Comprehensive Wildlife Conservation Strategy
Nevada's Birding Outreach Efforts

New Mexico

Oregon
McNary and Umatilla NWR Shorebird Projects
Wanaket Wildlife Mitigation Area
Malheur NWR Wetlands Management
Interior Snowy Plover Monitoring in Oregon
Interior Shorebirds in Oregon's Comprehensive Wildlife Conservation Strategy

Utah
Wetland Restoration At Ouray NWR, Utah
Conservation for Shorebird Habitat within Utah's BHCAs and IBAs
Great Salt Lake Waterbird Survey 1997-2001
Great Salt Lake Annual Phalarope Survey
Productivity of Shorebirds Breeding Within the Greater Salt Lake Ecosystem

Determining Live Capture Methods/Techniques for Migrating and Staging Marbled Godwits Abundance, Ecology, and Timing of Long-distance Migrant Shorebirds in Managed Wetlands at Great Salt Lake, Utah
Linking Communities, Wetlands and Migratory Birds Project
Shorebird Sister Schools Program and Associated Conservation Activities in Utah
Bear River Migratory Bird Refuge All-Bird Habitat Management Planning
A Plan for Monitoring Shorebirds during the Non-breeding Season in Region Utah-BCR 9
Coordinated Implementation Plan for Bird Conservation in Utah

Washington
McNary and Umatilla NWR Shorebird Projects
Moist Soil and Water Management at Columbia NWR
Long-billed Curlew Monitoring Surveys: Population Estimates, Trend Analysis, and
Habitat Associations on The Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge

Wyoming
Cokeville Meadows NWR Habitat Improvements
Habitat and Nesting Biology of Mountain Plovers in Wyoming
Minimum Population Size of Mountain Plovers Breeding in Wyoming

Multiple
Long-billed Curlew Rangewide Breeding Survey
International Shorebird Survey Sites in the Intermountain West
Great Basin Wetlands and Waterbirds
USFWS Outreach Activities with Shorebird Sister Schools
WHSRN Sites Within the Intermountain West
Population Genetic Analysis of Mountain Plover Using Mitochondrial DNA Sequence Data
Intermountain West Joint Venture Coordinated Implementation Plan for Bird Conservation

SCIENTIFIC NAMES OF SHOREBIRDS IN THIS REPORT

Common Name	Scientific Name
Black-bellied Plover	Pluvialis squatarola
Snowy Plover	Charadrius alexandrinus
Semipalmated Plover	Charadrius semipalmatus
Killdeer	Charadrius vociferus
Mountain Plover	Charadrius montanus
Black-necked Stilt	Himantopus mexicanus
American Avocet	Recurvirostra americana
Greater Yellowlegs	Tringa melanoleuca
Lesser Yellowlegs	Tringa flavipes
Willet	Catoptrophorus semipalmatus
Spotted Sandpiper	Actitis macularia
Upland Sandpiper	Bartramia longicauda
Long-billed Curlew	Numenius americanus
Marbled Godwit	Limosa fedoa
Western Sandpiper	Calidris mauri
Least Sandpiper	Calidris minutilla
Dunlin	Calidris alpina
Long-billed Dowitcher	Limnodromus scolopaceus
Wilson’s Snipe	Gallinago gallinago
Wilson’s Phalarope	Phalaropus tricolor
Red-necked Phalarope	Phalaropus lobatus