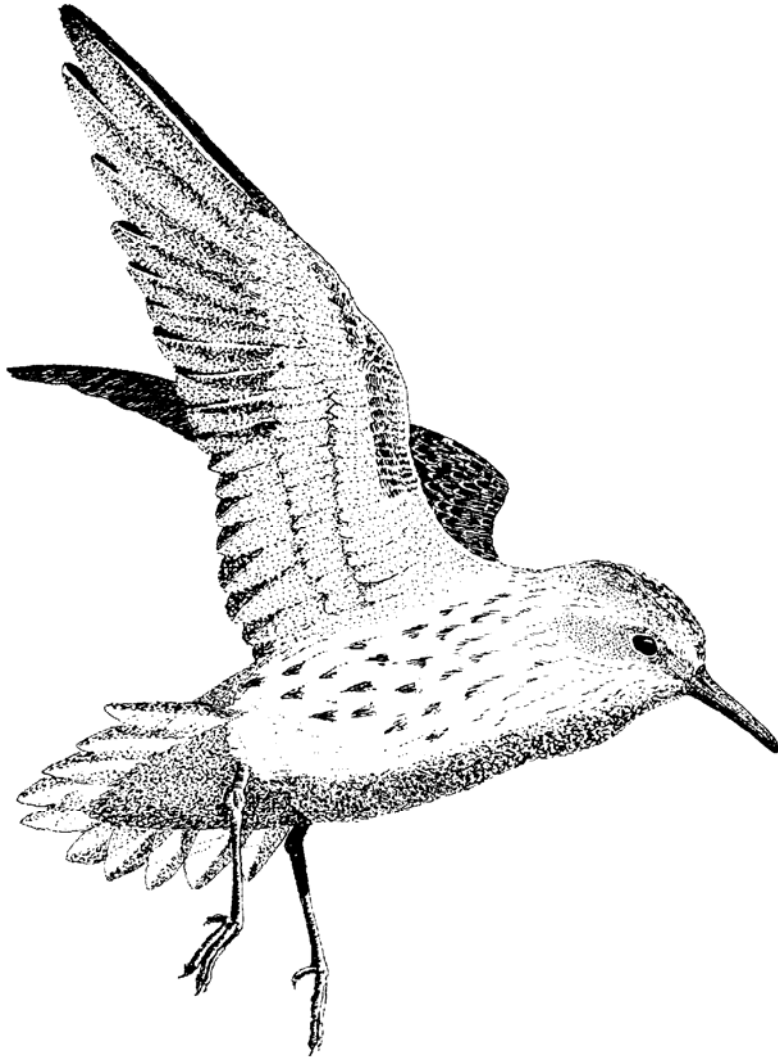


Summaries of current projects that benefit  
shorebirds in the coastal region of  
Oregon and Washington



Compiled and edited by

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for the  
Northern Pacific Coast Shorebird Working Group

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## Partners

The partnerships associated with the Northern Pacific Coast 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 that should prove beneficial to shorebirds. 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.

Americorps	Newport Field Office
Bureau of Land Management	Nisqually NWRC
Ducks Unlimited	Olympia Field Office
Ecostudies Institute	Shorebird Sister Schools Program
Grays Harbor Audubon	Washington Maritime NWRC
Manomet Center for Conservation Sciences	Willapa NWRC
Natural Resources Conservation Service	USFS
North Coast Land Conservancy	USGS
Oregon Dept. of Agriculture	Forest and Rangeland Ecosystem Science Center
Oregon Dept. of Fish and Wildlife	San Francisco Bay Estuary Field Station
Oregon Division of State Lands	Washington Dept. of Agriculture
Oregon Parks and Recreation Dept.	Washington Dept. of Ecology
Oregon State University	Washington Dept. of Fish and Wildlife
Pacific Coast Joint Venture	Region 4
Portland State University	Olympia
PRBO Conservation Science	Puget Sound Ambient Monit. Program
Prince William Sound Science Center	Washington Dept. of Natural Resources
Private Citizens	Washington Dept. of Parks and Recreation
The Nature Conservancy	Washington Dept. of Transportation
University of Washington	Washington State University
US Army Corp of Engineers	Wetlands Conservancy
USFWS	Weyerhaeuser
Coastal Programs	
Migratory Birds and Habitat Programs	

## Introduction

This report summarizes current or recent projects that benefit shorebirds in the Oregon and Washington portion of the Northern Pacific Rainforest Bird Conservation Region (BCR 5). The necessity for this summary became apparent during the last meeting of the Northern Pacific Coast Shorebird Working Group as the group attempted to identify steps needed to facilitate implementation of the regional shorebird conservation plan. The projects identified in this report were identified by working group members or other partners.

Each project description related to one of four of the five overall goals described in the Northern Pacific Coast Regional Shorebird Management Plan. These goals, and the number of projects reported in this document, include the following: research and monitoring (with 17 projects reported), management effectiveness and coordination (10), habitat (5), and outreach and education (4). It is assumed that progress toward achieving the first 4 goals supports the final goal of stabilizing or increasing shorebird populations in the region. Similar reports summarizing achievements in implementation will be available in the future. Many of the projects are supported by broad-based partnerships showing the high degree of importance attributed to shorebirds in this area.

It should be noted that this report reflects only those projects known by working group members or their current partners. For this reason, it should not be considered a comprehensive listing of projects. Thirty-six projects are summarized here. The Snowy Plover and Black Oystercatcher (see Appendix 1 for scientific names), two species of high conservation emphasis in the region, were the focus of intensive studies this year with four projects each. Three of the highest priorities in the region were recently summarized (“Priorities for Implementation of the Northern Pacific Coast Regional Shorebird Management Plan [USDA Forest Service General Technical Report PSW-GTR-191. In press.]). Numerous projects described in this report address those three priorities: elimination or control of invasive species (6 projects), restoration of degraded habitats (5), and oil spill response and prevention (2).

The inspiration for this first annual summary 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. The illustrations included in this report were provided courtesy of the Shorebird Sister Schools program.

Please contact the individuals noted as the primary contacts for more information on a specific project. Please contact Sue Thomas at [sue\\_thomas@fws.gov](mailto:sue_thomas@fws.gov) or call 503-231-6164 with updates on any of these projects, or with information about new partnerships or projects.

# Habitat Management

## Pacific Coast Joint Venture Partnership Projects for Habitat Restoration and Enhancement

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Joe La Tourrette, Washington Habitat Joint Venture, 360-754-2594 or [dipodomy@qwest.net](mailto:dipodomy@qwest.net)

The Pacific Coast Joint Venture (PCJV) is a public-private partnership, focused on the identification, protection, and restoration of key wetlands and associated upland and riparian habitats. The joint venture covers the area from coastal Alaska to Northern California, Puget Sound to Hawaii. The main objectives of the PCJV are to maintain sufficient habitat to support wetland-dependent wildlife at current population levels and to enhance these populations where desirable. Special effort may be directed toward species in decline or listed as endangered or threatened. The PCJV also serves as a vehicle for implementation of bird conservation initiatives, targeting habitat for all birds under the umbrella of the North American Bird Conservation Initiative.

PCJV projects that benefit shorebirds in the Northern Pacific Region abound. Current projects include:

- Protecting 550 acres of river delta habitat at the south end of Tillamook Bay, Oregon, including diked former pastures at the mouth of the Wilson River and a mile of bay-front at Kilchis Point;
- Restoring up to 400 acres of estuarine habitat in a new addition to the Bandon Marsh NWR within the Coquille River estuary, Oregon;
- Acquisition of a 350-acre floodplain wetland property at Seaside, Oregon;
- Acquisition of 500 acres encompassing some of Oregon's highest quality tidal wetlands at Yaquina Bay;
- Eradication of *Spartina* at several key sites in Willapa Bay, Washington, and monitoring shorebird response in control areas;
- Estuarine protection and restoration at North Bay in Grays Harbor, Washington;
- Development of Black Oystercatcher survey protocols.



## **Restoring, Enhancing, and Protecting Habitat in Oregon and Washington Through Partnerships with the Coastal Program**

Contact: Fred Seavey, U.S. Fish and Wildlife Service, 541-867-4558 or [fred\\_seavey@fws.gov](mailto:fred_seavey@fws.gov) (Oregon)

Mary Mahaffy, U.S. Fish and Wildlife Service, 360-753-7763 or [mary\\_mahaffy@fws.gov](mailto:mary_mahaffy@fws.gov) (Washington)

Paula Levin, U.S. Fish and Wildlife Service, 503-231-2014 or [paula\\_levin@fws.gov](mailto:paula_levin@fws.gov) (Regional)

The goal of the U.S. Fish and Wildlife Service's Coastal Program is to conserve healthy coastal ecosystems through partnerships that identify, restore, and protect habitat in priority coastal areas. Projects occur in a variety of habitat types from salt marsh along the ocean's edge to riparian habitats higher up in the watershed. The Coastal Program is a non-regulatory program that relies on voluntary partnership building. Partners include federal and state agencies, local and tribal governments, businesses, conservation organizations, and private landowners.

Some examples of the Coastal Program's projects in the Northern Pacific Region include:

- Puget Sound Coastal Program staff assigned to work for Washington State's Puget Sound Near Shore Habitat Program to assist with restoration planning;
- Assisting watershed councils and local communities with identifying and prioritizing sites for tidal wetland restoration in Oregon;
- Prevention of *Spartina* seed production at Triangle Cove, Washington;
- Helping partners to protect 364 acres of land in the Necanicum River watershed, Oregon, including significant portions of the estuary; and
- European beachgrass removal in Western Snowy Plover nesting habitats along both the Washington and Oregon coasts (described elsewhere in this document).

### **Northern Puget Sound Habitat Acquisitions and Enhancements**

Contact: Lora Leschner, Washington Department of Fish and Wildlife, 425-775-1311 ext 121 or [Leschl1@dfw.wa.gov](mailto:Leschl1@dfw.wa.gov)

Washington Department of Fish and Wildlife partnered with Ducks Unlimited to obtain over 3 million dollars in North American Wetlands Conservation Act grants for acquisition and restoration or enhancement of properties. Targeted acquisition areas include estuary habitats and a 750-acre site along one of the few remaining un-diked portions of the lower Skagit River. Negotiations are now underway with landowners to purchase the properties.

Ducks Unlimited partnered with WDFW to restore and enhance a freshwater wetland site at WDFW's Tenent Lake Wildlife Area in Whatcom County. This project was recently completed and is expected to greatly increase wetland habitat available to shorebirds.

### **Northern Olympic Peninsula Habitat Restoration**

Contact: Pam Sanguinetti, Washington Maritime National Wildlife Refuge Complex, 360-457-8451 or [pam\\_sanguinetti@fws.gov](mailto:pam_sanguinetti@fws.gov)

Shorebirds in Dungeness Bay use the refuge tidelands and the area near the Dungeness River mouth for foraging. However, dikes have restricted the natural flow of the river and eliminated estuarine habitat. Clallam County and Washington Department of Fish and Wildlife are seeking federal grants to purchase private lands so that lower river dikes can be removed. The refuge is cooperating with Washington Department of Fish and Wildlife on grant proposals to monitor current shorebird use and include shorebird conservation in future management scenarios.

In March 2004, refuge biologists participated in a technical working group focused on near-shore restoration for the central Strait of Juan de Fuca. The workgroup was asked to identify priority research and restoration opportunities for the Elwha River estuary. Removal of the Elwha and Glines Canyon dams upstream will result in approximately 18-million cubic yards of material being released. Much of that material will be delivered to the Elwha River estuary in the Strait of Juan de Fuca and produce marked changes in the habitat. Little data are available on shorebird use of the estuary and surrounding environments. Removal of the dams and resulting disposal of sediments in the river mouth could prove beneficial to migratory species such as Western Sandpipers and dowitchers. Conversely, rocky shoreline species may be adversely affected in the local area

### **Oregon Parks and Recreation Habitat Management Activities**

Contact: Michelle Michaud, Oregon Parks and Recreation, 503-986-0737, or [michelle.michaud@state.or.us](mailto:michelle.michaud@state.or.us)

Habitat acquisition and management activities are one of the top priorities of the Oregon Parks and Recreation Department. Recent acquisitions include 120 acres at Sunset Beach, an Important Bird Area on the northern coast; estuarine habitat in Sand Lake estuary; rocky shoreline at Sisters Rock; and coastal property near San Sebastian.





## Management Effectiveness and Coordination

### Comprehensive Unified Plan for Spartina Control in Willapa Bay

Contact: Terri Butler, Willapa NWRC, 360-484-3482 or [terri\\_butler@fws.gov](mailto:terri_butler@fws.gov)

Dr. Kim Patten, Washington State University, 360-642-2031 or [pattenk@cahe.wsu.edu](mailto:pattenk@cahe.wsu.edu)

Miranda Wecker, University of Washington, 360-484-7128 or [mwecker@willapabay.org](mailto:mwecker@willapabay.org)

The highest priority of the Northern Pacific Coast Regional Shorebird Management Plan is to restore tide flat areas invaded by *Spartina* and control the spread of *Spartina* to other areas. In 1994, *Spartina alterniflora* was noted as a potential problem in Willapa Bay. By 2002, the affected area had nearly tripled, covering two of the most important mudflats in the bay for shorebirds. *Spartina* is a smooth cordgrass native to estuaries of the Atlantic. It grows in clone fields that become dense meadows, colonizing mudflats and eliminating vital foraging habitat for shorebirds. Surveys in the early 90's noted up to 100,000 Western Sandpipers, Dunlins, and Short-billed Dowitchers during spring migration. They also indicate that over 15% of the Pacific Flyway population of Dunlins, spend the winter in Willapa Bay. In recent years, however, biologists at Willapa National Wildlife Refuge noted a potential decline of up to 60% in shorebird use of those same areas.

Willapa National Wildlife Refuge began the overwhelming task of *Spartina* removal in 1999 in the southern portion of Willapa Bay, initially using large scale mowing in the *Spartina* meadows while Washington State agencies applied herbicide using airboats on the clone fields. After determining large scale mowing was ineffective to control the spread of *Spartina* the refuge turned to other methods. The refuge began tilling *Spartina* in the winter of 2000 hoping to open up large areas of mudflats and to control/eradicate this invasive species. Tilling during the winter months has proven effective to control *Spartina* by chopping up the plants and creating a slurry which effectively smothers the plants. In 2001, the refuge began using herbicide on the *Spartina* meadows and clone fields during the growing season to further control/eradicate the spread of *Spartina*.

In 2002, the Comprehensive Unified Plan for Spartina Control was cooperatively developed by the U.S. Fish and Wildlife Service, University of Washington - Olympic Natural Resource Center, Washington State University, other local constituents, and stakeholders. Under the Comprehensive Unified Plan for Spartina Control, the refuge and other stakeholders are systematically working to save Willapa Bay, an area that is important to shorebirds, other wildlife and the aquaculture industry. During the summer of 2004, the refuge began work in the south bay moving north to the Nemah River while the state agencies continued eradication in the north end of the bay, particularly around Willapa River, and worked south towards the Palix River. For more information, visit <http://www.willapabay.org/~coastal/nospartina/>.

## **Northern Puget Sound *Spartina* Task Force**

Contact: Kyle Murphy, Washington Department of Agriculture, 360-902-1923 or [kmurphy@agr.wa.gov](mailto:kmurphy@agr.wa.gov)

Washington State Department of Agriculture coordinates *Spartina* control efforts in northern Puget Sound through the Northern Puget Sound *Spartina* Task Force. Partners include Washington State Departments of Agriculture, Fish and Wildlife, Ecology; Island, San Juan, Skagit, and Snohomish counties and their noxious weed boards; the Swinomish Tribe, People for Puget Sound, and the Nature Conservancy. The objectives of the Task Force include removal of *Spartina* throughout northern Puget Sound, monitoring of previously controlled sites for regrowth, retreatment of sites when necessary, and treatment of all known infestations each year. Treatment methods include mowing, ground and aerial herbicide application, mechanical removal (crushing, disking, tilling), manual removal and biological control.

At the beginning of the 2003 season, approximately 760 solid acres of *Spartina* were estimated to occur in Puget Sound. During the year, approximately 90% of the infestation was treated, contributing to a 24% reduction since coordinated efforts to control *Spartina* began in 1997. This year's priorities include control of outliers to the main infestations in San Juan, Skagit, and Snohomish counties and reduction of the main infestations found in Triangle Cove and south Skagit Bay.



## **The Nature Conservancy Habitat Conservation in the Greater Skagit Delta**

Contact: Roger Fuller, The Nature Conservancy, 360-419-0175 or [rfuller@tnc.org](mailto:rfuller@tnc.org)

The Nature Conservancy's Port Susan Bay Preserve is located in northern Puget Sound. The preserve consists of 4,122 acres of excellent estuarine habitat, 160 acres of which are diked uplands. Due to the proximity of vast mudflats and lack of suitable high tide roosts in the area, the upland habitat adjacent to Port Susan Bay is a very important high tide roost (or resting) site for shorebirds. High counts, reported from the International Shorebird Survey database, have exceeded 30,000 shorebirds in winter and 50,000 during the spring and fall migration. Port Susan Bay is identified as a site of regional importance by the Northern Pacific Coast Regional Shorebird Management Plan.

*Spartina* invasion is one of the largest threats to the Port Susan Bay Preserve. The Nature Conservancy is working closely with the North Puget Sound *Spartina* Task Force to monitor for, and eliminate, *Spartina* clones throughout the northern Puget Sound including the Skagit River delta. The Nature Conservancy initiated a monitoring program in 2004 to test more efficient approaches to *Spartina* control and to develop efficient ways to locate, treat, and monitor new clones scattered among native vegetation in remote marsh areas

The Nature Conservancy has also produced a biodiversity assessment for the Greater Skagit-Stillaguamish Delta. This assessment provides baseline information on the biodiversity of the area, including key habitats and ecological processes and attributes, describes and ranks the threats to long-term sustainability of habitats and species, and prioritizes strategies for addressing those threats.

### **Oregon *Spartina* Response Plan**

Contact: Mark Systma, Portland State University, 503-725-3833 or [sytsmam@pdx.edu](mailto:sytsmam@pdx.edu)  
Tim Butler, Oregon Department of Agriculture, 503-986-4621 or [tbutler@oda.state.or.us](mailto:tbutler@oda.state.or.us)

Recognizing the potential for *Spartina* to quickly spread from either California or Washington, the Oregon Department of Agriculture developed the Oregon *Spartina* Response Plan in 2003. The plan reviews the biology, historical and current information on *Spartina* on the western coast and outlines a strategy to prevent, detect, identify, and eradicate the weed in Oregon. The goal of *Spartina* management in the state is to prevent the establishment and spread of any *Spartina* species in estuaries and coastal wetlands. It identifies four introduced, invasive species of *Spartina* found along the western coast of the United States for over a century. The plan then reviews methods of detection ranging from ground and boat-based surveys to fixed wing aerial surveys. It outlines the sequence to follow for confirmation and coordination of the response. Several management options are listed including digging, covering, mowing and chemical control. Contacts for equipment needs and species experts are also given. The report is available online at <http://www.clr.pdx.edu/publications/SpartinaPlan5-8.pdf>. Ongoing or future projects include a drift card study to determine where *Spartina* might disperse after washing out of Willapa Bay, surveys in Oregon, a study on the viability of fragments, and outreach to watershed councils.

Experts believe that 14 Oregon estuaries north of the Coquille River are at risk of *Spartina* invasion. The only known *Spartina* infestation in Oregon is on Cox Island Preserve, Siuslaw River Estuary, Oregon. A population of *S. patens* has been present on the island since the late 1930s. The Nature Conservancy has acquired the site and efforts at eradication are ongoing with a projected end date in 2010.

### **Western Snowy Plover Habitat Restoration**

Contact: Marie Fernandez, Willapa National Wildlife Refuge Complex, 360-484-3482 or [marie\\_fernandez@fws.gov](mailto:marie_fernandez@fws.gov) (Washington)  
Liz Kelly, Newport Field Office, 541-867-4558 or [liz\\_kelly@fws.gov](mailto:liz_kelly@fws.gov) (Oregon)

Partners in Western Snowy Plover conservation have teamed up to restore habitat for this threatened species along the sandy beaches of Oregon and Washington. The culprit is an invasive exotic species – European beachgrass.

Removal and control of European beachgrass is one of the top priorities identified in the Northern Pacific Coast Regional Shorebird Management Plan and the Draft Recovery Plan for the Pacific coast population of the Western Snowy Plover. Historically, beachgrass was used to stabilize dunes as it quickly establishes itself and spreads. However, in the process, it covered prime plover nesting habitat. Habitat restoration involves leveling the foredune and clearing

beachgrass to create open, sand habitat or clearing beachgrass from around the foredune and cutting a path behind it for a sheltered nesting site. Removal methods include bulldozing the entire foredune, discing beachgrass, and/or applying spot herbicide. In one habitat restoration area, oyster shell hash was distributed within the area to provide additional cover for plovers and potentially reduce problems with blowing sand. Focal areas include Leadbetter Point in Washington, and New River, Bandon, Coos Bay North Shore, Tenmile, Overlook, and Sutton beaches in Oregon. These projects have proven to be extremely successful, with plovers nesting in the recently cleared sites the next breeding season. To learn more visit: [http://www.prd.state.or.us/osmp\\_hcp.php](http://www.prd.state.or.us/osmp_hcp.php).

### **Grays Harbor and Nisqually National Wildlife Refuges Habitat Improvement Projects**

Contact: Marian Bailey, Nisqually NWRC, 360-753-9467 or [marian\\_bailey@fws.gov](mailto:marian_bailey@fws.gov)

Staff at Grays Harbor National Wildlife Refuge - also known as Bowerman Basin - have been actively working on habitat improvement and protection on the refuge. This includes controlling invasive plants such as *phragmites*, reed canary grass (*Phalaris arundinacea*) & Japanese knotweed (*Polygonum cuspidatum*) on the refuge in coordination with the Grays Harbor County Weed Board. In addition, they are surveying for *Spartina* and other exotic plants that would impact the basin and reduce shorebird stopover habitat. The refuge, in cooperation with Washington Department of Transportation, is also controlling the spread of exotic vegetation and planting native vegetation on a shared property line. The refuge has also coordinated with partners on emergency drills to assess and protect Grays Harbor from oil spills originating from ocean-going freighters.

Nisqually National Wildlife Refuge staff are actively monitoring for and controlling exotic species in coordination with Thurston County Weed Board. Efforts to date have focused on *Spartina* and European green crab (*Carcinus maenas*) surveys. In addition, they are conducting shorebird surveys in coordination with nearby estuary restoration efforts. Plans are underway to monitor shorebirds and invertebrates on refuge delta mudflats should funding become available.



### **Oil Spill Prevention and Response Efficiency**

Contact: Mary-Ellen Voss or Jon Neel, Washington Department of Ecology,  
[mevo461@ecy.wa.gov](mailto:mevo461@ecy.wa.gov), 360-407-7211 (MV) 360-407-6905 (JN)

Through funding from the Washington State Legislature and with support from the Washington Department of Ecology, the state-contracted rescue tug will be stationed at the entry to the Strait of Juan de Fuca during the fall and winter of 2004 to aid in oil spill prevention. This project addresses the second highest priority of the Northern Pacific Coast Regional Shorebird Management Plan, to improve oil spill prevention strategies and enhance spill response efficiency (Buchanan, in press). Approximately 15 billion gallons of oil are carried through the Strait of Juan de Fuca annually. With the next closest rescue tug typically at least 5-6 hours east of the entry point to Puget Sound, a ship that loses steering or power in the Strait of Juan de Fuca can quickly run aground, increasing the potential for an oil spill.

During migration, up to 20,000 shorebirds have been reported by refuge biologists in Dungeness Bay tidelands. In addition, thousands of shorebirds, particularly Dunlins and "rocky shorebirds" winter along the strait. Also at risk are key sites in northern Puget Sound. This fall/winter will mark the seventh season a rescue tug has been stationed in Neah Bay. The rescue tug is one of the few prevention measures available on the coast. For further information, visit <http://www.ecy.wa.gov/programs/spills/spills.html>, then click on "Rescue Tug" under "Hot Topics."

### **Best Management Practices for Migratory Bird Care During Oil Spill Response**

Contact: Catherine Berg, U.S. Fish and Wildlife Service, 907-271-1630 or  
[catherine\\_berg@fws.gov](mailto:catherine_berg@fws.gov)

The USFWS recently released the "Best management practices for migratory bird care during oil spill response." The document is meant to assist in the development of contingency plans for protecting unoiled birds by keeping them away from the spill site and caring for oiled birds. The document is available online at <http://contaminants.fws.gov/Issues/OilSpill.cfm>.

### **Habitat Conservation Plan for the Western Snowy Plover and Oregon's Ocean Shore Management Plan**

Contact: Michelle Michaud, Oregon Parks and Recreation, 503-986-0737,  
[michelle.michaud@state.or.us](mailto:michelle.michaud@state.or.us)

The Oregon Parks and Recreation Department (Department) has developed the Ocean Shore Management Plan (OSMP) for property extending from extreme low tide to the statutory or actual vegetation line, whichever is most landward. The OSMP aims to take a "big picture" view of the department's beach jurisdiction, including over 200 miles of sandy beach in seven counties. This plan will open a forum for discussions with neighbors, visitors and governmental partners about shared beach management issues and will establish the basis for future management decisions and partnership efforts. The OSMP addresses recreational beach activities, needs and conflicts (including upland conflicts), special beach activities permitting (such as alterations and removal of natural products) and general beach resource constraints.

The department has also developed a Habitat Conservation Plan (HCP) for the Western Snowy Plover, a federal and state threatened species. The HCP addresses how the Department intends to minimize, and mitigate for, impacts to Western Snowy Plover resulting from those management activities undertaken by the department on the ocean shore. The HCP addresses both existing plover management areas, as well as unoccupied plover management areas. The department is also a key player in habitat restoration and monitoring projects for the Western Snowy Plover, described separately in this document.

### **The Nature Conservancy Ecoregional Assessments**

Contact: Dick Vander Schaaf or Ken Popper, The Nature Conservancy, 503-230-1221 or [kpopper@tnc.org](mailto:kpopper@tnc.org)

The Nature Conservancy has taken landscape planning to the next level with ecoregional planning. The goal of these assessments is to assist land managers and planners in prioritizing conservation activities based on sound biological, physical and socio-economic information. The final product is a comprehensive analysis of digital, spatial data for target species and habitats arranged by key sites in the ecoregion. Sites are selected based upon the number of conservation targets or important elements of biodiversity to the overall ecoregion. These conservation targets consist of major habitat types, species from terrestrial, marine, and freshwater environments and rare plant communities. Areas included in the ‘portfolio’ are considered the last places where many of the ecoregion’s most imperiled species occur or the last, large expanse of relatively intact natural habitat. The value to joint venture partners, state agencies, planners or other land managers is that this analysis occurs across all ownerships and habitat types. A key factor in the analysis is the use of a suitability or cost index for all sites. This index influences the final selection of sites, within terrestrial, marine, and freshwater portfolios, based on weighted factors that represent the likelihood of successful conservation. Examples of common factors include current condition, degree of development or land use, ownership and road density.

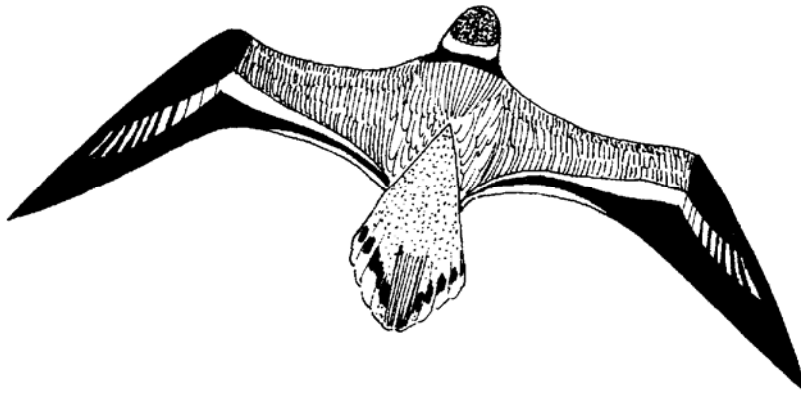
Two ecoregional assessments encompass the Northern Pacific Region. The Willamette Valley-Puget Trough-Georgia Basin Ecoregional Assessment is available online at [www.conserveonline.org](http://www.conserveonline.org). The Northwest Coast Ecoregional Assessment is currently in draft form. It should be available soon at [www.conserveonline.org](http://www.conserveonline.org).

## Monitoring and Research

### Willamette Valley Wetlands and Waterbirds

Contact: Oriane Taft, Peter Sanzenbacher, Susan Haig, USGS – Forest and Rangeland Ecosystem Science Center, 541-750-7482, or [Susan\\_Haig@usgs.gov](mailto:Susan_Haig@usgs.gov), [Oriane\\_Taft@usgs.gov](mailto:Oriane_Taft@usgs.gov), [Petersanz@yahoo.com](mailto:Petersanz@yahoo.com)

We studied habitat use of Dunlin and Killdeer in the Willamette Valley (Valley) of Oregon during the winters of 1998-1999, 1999-2000 and 2000-2001 to understand how conservation efforts should proceed at both a local and landscape scale. Our specific objectives were to: 1) characterize the historical (circa 1840) nature and waterbird use of Valley wetlands from historical land cover data and primary accounts (e.g., from naturalists, settlers, fur trappers), 2) quantify present-day distribution of wetland habitat using a combination of remotely sensed imagery and data acquired in the field, 3) quantify abundance of invertebrate resources on agricultural wetlands today, 4) determine regional fidelity, winter home range, and movements of 67 radio-marked Dunlin and 24 radio-marked Killdeer, and 5) examine influences of wetland landscape structure and local conditions on winter wetland habitat use (frequency of occurrence, bird abundance). For objective 5, we examined how use of regions and individual wetland sites were related to wetland landscape structure (amount of shorebird habitat within regions) and landscape context (amount of shorebird habitat surrounding sites), respectively. We also used locally measured features (availability of shorebird habitat and invertebrate abundance within wetlands) to assess evidence for hierarchical habitat use (influence of shorebird habitat within and surrounding sites) and to determine if landscape context mediated the influence of local food abundance on bird use.



Historical research revealed that Valley wetlands were of three valuable types to nonbreeding waterbirds (i.e., emergent wetlands, riverine wetlands, and wetland prairie) and the numbers and diversity of waterbirds using these wetlands was generally much greater than they are today. The most extensive wetland habitat type was wetland prairie, which functioned as valuable fall/winter habitat for waterbirds, but only while native Kalapuyans managed the region

with fire. Current land cover data from the winters of 1999-2001 indicate that while prime shorebird habitat (wet, unvegetated) on agricultural land can be abundant and widely distributed in wet years, it is typically scarce and more aggregated during dry winters. Compared to resource levels in winter at other important wintering regions in North America, invertebrates of Valley wetlands were of moderate abundance for most sites sampled. Dunlin and Killdeer exhibited a high degree of regional fidelity and extensive local movements indicated a high level of habitat connectivity across the landscape. Finally, landscape structure was an important determinant of Dunlin abundances, but only during the dry winter of 2000-2001. Dunlin were attracted to regions with more available shorebird habitat and they were most abundant at those sites with the most surrounding wet, unvegetated habitat. Dunlin abundances at sites were also positively associated with local conditions (amount of available wet habitat, percent of soil exposed, invertebrate food abundance) during the dry winter. Killdeer use of sites was unrelated to landscape structure and local conditions during all winters studied.

Our results indicate that wetland landscapes like the Valley hold great potential for restoration and that landscape planners should consider the spatially-explicit nature of wetland sites (where they are located in relation to others) when prioritizing sites to conserve. Within individual wetlands prioritized for conservation, managers should then promote certain local conditions (shallowly flooded and exposed substrates, productive invertebrate communities) that benefit foraging shorebirds and other waterbirds. We are currently working with the Natural Resource Conservation Service and numerous other partners to develop ecosystem-wide wetland management and restoration plans for the Willamette Valley.

### **Migration of Western Sandpiper and Short-billed Dowitchers Along the Pacific Flyway: Migration Strategy vs. Habitat Quality**

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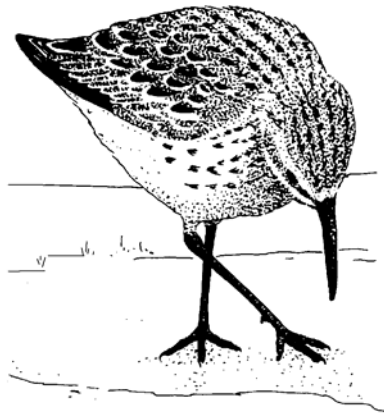
Migrant Western Sandpipers were studied along the Pacific Flyway from Baja California, Mexico, to the Yukon-Kuskokwim Delta, Alaska, during spring 2004. The main objectives of this project included:

- Determining spring migration routes between Baja, Mexico, and western Alaska;
- Estimating the length of stay at stopover sites;
- Evaluating the interrelationship of stopover sites along the Pacific Flyway;
- Indirectly evaluating habitat quality of specific stopover sites; and
- Improving public awareness of shorebird conservation by featuring the project on the USFWS Shorebird Sister Schools list serve and web site.

Two components of the migration of Western Sandpipers were examined: 1) strategies of stopover use by individual sandpipers, and 2) quality of migratory stopovers. Birds were marked with radio transmitters in Mexico and California and followed as they moved north. A sample of



blood was drawn from each radio marked bird to analyze plasma metabolites, particularly triglyceride levels, that give an indication of whether a bird has recently (within a few days) gained or lost mass. Radio marked birds were then followed through migration to see how blood chemistry parameters correlate with migration strategies. Within the Northern Pacific region, blood samples were taken from additional Western Sandpipers at Grays Harbor, Washington, and Bandon Marsh, Oregon. Invertebrates were also sampled at these sites to see if invertebrate biomass correlated with stopover length and plasma metabolite levels in shorebirds.



### **Shorebird Response to *Spartina* Control Efforts in Willapa Bay**

Contact: Dr. Kim Patten, Washington State University, 360-642-2031 or [pattenk@cahe.wsu.edu](mailto:pattenk@cahe.wsu.edu)

Surveys reported by Buchanan and Evenson, from 1991-1995, reported over 100,000 shorebirds using Willapa Bay during spring and over 50,000 in winter. Approximately 44% of the total bird usage occurred in two areas, the South Bay and Willapa River area. These two areas have become almost contiguous *Spartina* meadows. Since the initial surveys in the 90's, biologists at Willapa NWR have noted a decline of over 60% in peak winter and spring shorebird usage at the same sites. As *Spartina* meadows replace tidal mudflats, the rich array of invertebrates are depleted. In addition, shorebirds appear reluctant to feed in or near *Spartina* meadows. Researchers with Washington State University are monitoring shorebird use in South Willapa Bay in conjunction with *Spartina* control efforts (described elsewhere in this document) to measure the success of those efforts and suggest further refinements to treatment methods to benefit shorebirds.

Since the winter of 2002, researchers have logged hundreds of hours of visual and remote video camera observations during winter, peak spring and fall migration. Preliminary results show that native mudflat had the highest use, followed by tilled *Spartina* meadow. Sprayed meadow and spray-mowed meadow were rarely used by shorebirds. The untreated *Spartina* meadow was not used at all. Measures of prey abundance following *Spartina* eradication indicate that the use of herbicides or tilling does not negatively affect prey. However, areas previously infested with *Spartina* have a reduced prey density compared to native mudflat. Shorebird response to

treatments, prey densities and the effects of mudflat compaction on shorebird foraging will be evaluated in 2004/2005.

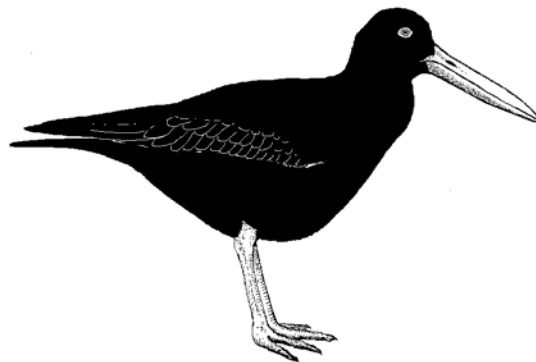
### **Development of Standardized Monitoring Protocols for Black Oystercatchers**

Contact: Sue Haig, USGS – Forest and Rangeland Ecosystem Science Center, 541-750-7482 or [susan\\_haig@usgs.gov](mailto:susan_haig@usgs.gov)

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Localized surveys have been conducted for Black Oystercatchers in the southern half of the range, providing useful information on presence or absence at locations easily accessible to surveyors. This project is designed to expand upon localized efforts to provide a framework for determining the current status and distribution of oystercatchers from Washington to California. It will also provide insight into management needs over the larger scale.

Three initial steps will be taken in the next year to evaluate the current population status, distribution, and population trends of Black Oystercatchers in California, Oregon, and Washington including: 1) Develop a boat and land-based protocol for surveying breeding Black Oystercatchers along the coast and off-shore islands. Since oystercatcher detectability likely differs for land and boat surveys, we will develop and evaluate techniques to address and correct for differences. We will also evaluate how to obtain the best survey results (i.e., number of days of survey and timing of survey in relation to location on the coast). 2) Network with biologists across the species' range to develop contacts, identify survey sites, and generate maps for all known or potential breeding sites. Using aerial photography and other available geospatial data, we will generate digital, geographically referenced maps of all sites. Maps will be used by surveyors in the field and will be suitable for plotting oystercatcher and nest locations so that density and distribution may be analyzed across the western U.S. 3) Increase understanding of population status, trends, threats to persistence, and natural fluctuations over time, we will also develop a long-term monitoring plan. This plan will include both annual monitoring at a subset of sites and a more comprehensive survey periodically. Annual monitoring will help identify and safeguard against acute threats such as oil spills and human disturbance; periodic monitoring will provide long-term trend data.



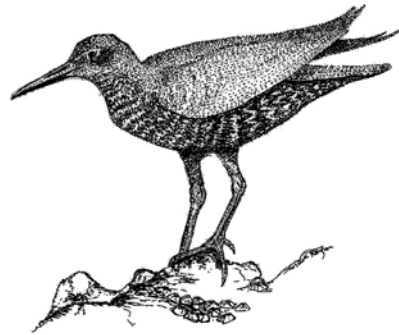
## **Northern Puget Sound Black Oystercatcher Surveys**

Contact: Dave Nysewander, WDFW – Puget Sound Ambient Monitoring Program, 360-902-8134 or [nysewdrn@dfw.wa.gov](mailto:nysewdrn@dfw.wa.gov)

Surveys for Black Oystercatchers were conducted in 1974 and 1975 throughout western Washington with focused breeding studies on Destruction Island. General nonstandardized surveys occurred periodically in the San Juan Islands between the 1970's and 1990's, mostly by USFWS refuge staff or incidental observations. Oystercatcher territories were identified and monitored between 1999 and 2004 by Washington Department of Fish and Wildlife in conjunction with Pigeon Guillemot surveys (600 sites). The goal of the study is to compare population estimates and breeding attempts through replication studies. Three surveys of each Pigeon Guillemot colony site were primarily conducted during May from daybreak to 9AM. Oystercatcher observations were either gathered during this survey or during the day thereafter. The goal of the oystercatcher work was to document nesting attempts and gain a better estimate of the local population. Approx. 100 – 120 islands were surveyed each year for both Black Oystercatchers and Pigeon Guillemots. Oystercatchers were found on 45 – 50 of the islands surveyed. An average of 55 nests was located. GPS coordinates were noted for nests and possible non-breeding groups. High site fidelity was observed for breeding birds.

During May of 2000-2003, voluntary surveys were conducted specifically for Black Oystercatcher in the inner marine waters of Puget Sound and San Juan Islands by boat. Whenever possible, sites were visited several times during the month. Approximately 80-90% of the territories contained nests each year. In 2003, the oystercatcher territories were visited during May and June, but these results have not been tabulated. However, 2000-2002 survey results indicate that numbers of breeding oystercatchers have remained relatively stable at 50 to 60 breeding pairs plus approximately 40 non-breeders on 45 of the 100 sites usually examined. Surveys were not conducted in 2004 due to logistical issues. The data are archived in Washington Heritage Program database in Olympia, Washington, as well as in the Marine Bird and Mammal Component of the Puget Sound Ambient Monitoring Program in WDFW, also in Olympia.

WDFW encourages collaboration with Canada in conducting surveys of oystercatchers in the northern inner marine waters of Washington and the adjacent Gulf Islands in Canada. Some banded oystercatchers from British Columbia have been observed near the San Juan Islands during the nonbreeding season. Populations of oystercatchers have redistributed their breeding efforts and concentrations over the years possibly due to disturbance and predation factors in these inner marine coastlines. The increased presence of Bald Eagles, Peregrine Falcons, and people may have had an effect on changing breeding efforts at certain sites when compared with occurrence during the 1970's. Predation pressure varies by season and presence of seabird species. Wintering surveys have not been conducted, however, some winter concentration areas are known. More systematic inventories are needed.



### **Black Oystercatcher Surveys of Washington Maritime National Wildlife Refuge Complex**

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Black Oystercatchers have been monitored on the Washington Maritime Refuges to varying degrees over the past 30 years. Variation in the timing of chick growth and development has been observed and it is thought that Washington oystercatchers may breed later than Oregon birds. Further, oystercatchers have been observed with small chicks as late as August at Dungeness NWR. The Refuges have had 3 fire events within a 5-year period in Black Oystercatcher breeding areas. Adults have exhibited high nest site fidelity, even remaining on a nest with eggs regardless of smoke, flames, and firefighters around the nest.

Annual surveys were conducted in July 2004, on San Juan Island NWR. Surveys were conducted by boat, 50-yards offshore. Standardized surveys from the past 5-years have shown a pattern of no chicks observed on alternating years. It is unknown whether this apparent pattern reflects changes in productivity or some other factor such as differences in detectability of chicks. Total birds are noted, but productivity is harder to document without more intensive or repeated visits.

The small breeding population on Dungeness NWR appears to be increasing. Human disturbance is a concern at this refuge, but the birds have been fairly tolerant of disturbance from people walking within sight of nesting areas. The nesting area is closed, but thousands of visitors (total refuge visitation ~90,000 people) walk within 50 yards of the nests. One possible reason for nest success could be that human presence deters mammalian predators. A previously successful nest in close proximity to a recently established Caspian Tern colony was abandoned in 2004, possibly due to predators attracted to the tern colony.

Protection Island NWR is surrounded by a 200-yard protected zone, so nesting Black Oystercatchers encounter little human disturbance. Surveys have been conducted over the past 30 years, but more intensively during the past 11 years. Nest counts have dropped significantly. A productivity survey was completed in 2004. Results will be reported in the scientific literature. Early results show a lower productivity in relation to the Glaucous-winged Gull colony. Predation from gulls on Black Oystercatcher eggs and chicks have been observed. The island also hosts up to 50 Bald Eagles. Aggressive interactions have been observed between

eagles and Black Oystercatchers, but oystercatcher nests have been productive in areas with high eagle counts. No corvid interactions with Black Oystercatcher were noted. There is some concern by management that Black Oystercatcher surveys can create disturbance to nesting seabirds that share the island. Productivity surveys were primarily completed by boat, which was more difficult and required intensive, repeated visits.

The Washington Coastal Refuges are logistically very difficult to survey. There is the potential to cover the Washington coast as a cooperative effort between agencies. There are no known winter concentrations of Black Oystercatcher on the Washington Maritime Refuges. However, winter surveys are needed in the San Juan Islands.

### **Surveying Black Oystercatchers along the Oregon Coast**

Contact: Liz Kelly, USFWS – Newport Field Office, 541-867-4558 or [liz\\_kelly@fws.gov](mailto:liz_kelly@fws.gov)  
Elise Elliott-Smith, USGS – Forest and Rangeland Ecosystem Science Center, 541-750-7390 or [eelliott-smith@usgs.gov](mailto:eelliott-smith@usgs.gov)

Black Oystercatcher surveys are conducted along the Oregon coast predominantly through a volunteer effort. This survey consists of one visit per year to known nesting sites by land. Survey dates have ranged from mid-May to late June. To date, 22 sites have been surveyed. Seven of these sites are located on the central Oregon coast and have been surveyed consistently over the past eight years. The remaining 15 sites on the north and south coast have been surveyed inconsistently. Due to the limited time frame of this survey, nesting success is unknown. Some winter concentration areas are known based on observations reported by local bird watchers.

The 8<sup>th</sup> Annual Black Oystercatcher Survey was held on June 18, 2004. Fifteen sites were surveyed. Fifty-nine adult oystercatchers were observed, of which 21 were pairs. Three of the pairs had a total of seven young. There was also one confirmed nest and two suspected nests. A state-wide total of 350 Black Oystercatchers was estimated during seabird surveys from 1995-1998. This estimate has recently been revised to 419 in Oregon (Roy Lowe, personal communication). More intensive monitoring of Black Oystercatchers and assessment of site fidelity, fledgling success, and dispersal patterns in focal areas is needed.

The USGS is developing a standard survey protocol for breeding Black Oystercatchers and identifying known and potential breeding sites along the Oregon coast. It is intended to expand the current one-day window survey to a more comprehensive coast-wide survey with land and boat-based components. Results will provide a current inventory of Black Oystercatchers in Oregon for use in habitat management and to assist in detecting declines if they occur. All sites will be surveyed during the second week of May. The initial one-week survey window will be followed with a minimum of two additional surveys at each site to ensure detection of all birds. Follow-up surveys will be spaced 1-2 weeks apart, and at least two surveys will be completed by June 15.

## **Catalog of Shorebird High Tide Roost Locations in Western Washington**

Contact: Joseph B. Buchanan, Washington Department of Fish and Wildlife, 360-902-2697 or [buchajbb@dfw.wa.gov](mailto:buchajbb@dfw.wa.gov)

Shorebird roost locations serve an important function for shorebirds during the non-breeding season. Roost sites are typically very specific locations and are often small in size. Disturbance of roost sites or habitat alterations that make the roost an ineffective location for birds to rest are undesirable, and efforts should therefore be made to identify and protect these important sites.

This project is an ongoing effort to develop a database of roost locations used by shorebirds in western Washington. Roost locations are identified on a map (or written in great detail) and supporting information (species, number of birds, date) is recorded. Roost locations have been compiled for Grays Harbor, Willapa Bay and much of Puget Sound. The effort will include contact with local bird-watchers to obtain or refine location information. Where possible, photographs will be used to provide more information about the attributes of the sites.

## **Procedures for Monitoring Western Snowy Plovers and Evaluating Management Techniques and Suitable Habitat**

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Elise Elliott-Smith, USGS – Forest and Rangeland Ecosystem Science Center, 541-750-7390 or [eelliott-smith@usgs.gov](mailto:eelliott-smith@usgs.gov)

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USGS is assisting the USFWS and their federal and state partners with Western Snowy Plover recovery efforts through the development of range-wide survey protocols, evaluation of recreation and predator management at selected sites, and evaluation of suitable habitat along the Oregon coast.

Western Snowy Plover population recovery status is assessed annually through range-wide surveys during non-migratory periods, over a narrow time frame to minimize the chance of recounting birds moving between sites. Rather than represent a total count, these surveys give an index of population size. The USGS is developing three protocols to survey plovers at wintering, breeding, and potential breeding sites. The wintering and breeding survey protocols aim to standardize survey methodology range-wide. Results from these surveys can be compared, across the population range and between years, to detect trends in distribution and abundance over time. The "potential sites" protocol was developed for new or recolonized historic sites used by breeding plovers. This protocol is designed to detect new sites early in the nesting period, thereby assuring that they receive the same protections as known territories.

USGS is also assisting the USFWS in determining the efficacy of beach management restrictions for nesting Western Snowy Plover near the Siltcoos River Estuary on the central Oregon Coast. This area receives a high amount of all-terrain-vehicle, pedestrian, dog, and watercraft use. Fledgling success (30%) and nest success (34%) in the Siltcoos River Estuary is lower than overall fledgling (38%) and nest success (49%) on the Oregon coast from 1990 to 2003. This

study will document the type of response to human disturbance, monitor compliance with beach restrictions, and determine other factors that may cause disturbance. Nest attendance during the week will be compared with the weekend. USGS is also developing a project to assess predation pressure on nests at Leadbetter Point, Washington, and Siltcoos River mouth, Oregon. State and federal agency personnel will use still (motion/heat sensor) and video cameras to document any species that prey on nests during the breeding season.

USGS has begun to map plover habitat along the southern and central coast, using Light Detection and Ranging (LIDAR) data and GIS. The project involves the creation of digital elevation models (DEMs) and measuring habitat variables such as elevation, slope, aspect, distance to mean higher high tide, and distance to vegetation. Using logistic regression to analyze habitat parameters and enter significant parameters into a cartographic model, one can predict suitable plover habitat across the landscape and potentially locate new territories. Currently, DEMs have been created, but additional funding is needed to complete the project.

### **Western Snowy Plover Monitoring**

Contact: Max Zahn, Washington Department of Fish and Wildlife, 360-753-2600 or [Zahnzmz@dfw.wa.gov](mailto:Zahnzmz@dfw.wa.gov) (Washington)

Liz Kelly, USFWS – Newport Field Office, 541-867-4558 or [liz\\_kelly@fws.gov](mailto:liz_kelly@fws.gov) (Oregon)

Nest searches and Western Snowy Plover surveys were done in all areas along the coast of Washington where plovers are known to nest: 1) Leadbetter Point area and south on the Long Beach Peninsula, 2) Midway Beach area (near Grayland), and 3) Damon Point area (near Ocean Shores). The Washington Department of Fish and Wildlife has been placing wire exclosures around Western Snowy Plover nests on beaches. This protective device is reducing predation and increasing plover fledging success.

Partners in Western Snowy Plover recovery began monitoring the species' distribution and reproductive success along the Oregon coast in 1990. During the 2003 nesting season, observers monitored 50 broods including four from unknown nests and documented at least 60 fledglings, the highest number of fledglings since monitoring began. Despite this apparent success, the Oregon and Washington population remains relatively stable at approximately 130 breeding adults. Limiting factors include loss of habitat, predation, and recreational pressures.

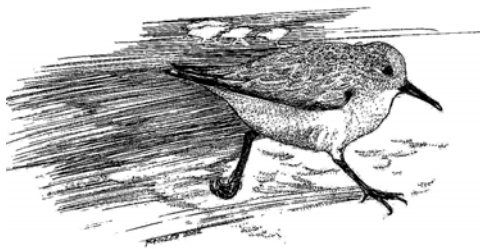
### **Shorebird Monitoring at Pacific Coast Beaches in Washington**

Contact: Joseph B. Buchanan, Washington Department of Fish and Wildlife, 360-902-2697 or [buchajbb@dfw.wa.gov](mailto:buchajbb@dfw.wa.gov)

The southern coast of Washington has three extensive sand beaches (Ocean Shores, Grayland, and Long Beach) separated from two large estuaries (Grays Harbor and Willapa Bay) by narrow peninsulas dominated by dunes and lowlands. These beaches support the vast majority of migrant and wintering Sanderlings in Washington and have been host to some of the highest densities of this species in the western hemisphere. The coastal beaches provide high tide roosting habitat for large numbers of several shorebird species during migration and winter. The

three sites were visited during winter in much of the 1980s and between 2000 and the present. Visits in spring and autumn have been made during the same time period.

These beaches appear to be very important for several shorebird species. Several thousand Sanderlings typically use the beaches each winter, and migration counts are much higher. Preliminary analyses of winter Sanderling count data indicate apparently stable or increasing numbers of the species on Washington beaches since the early 1980s. Nearly 50,000 Dunlins and 4000+ Black-bellied Plovers have been encountered during high tides. Western Snowy Plovers use two beaches for nesting, and about 20 color-banded birds have been observed. Other seasonally common species include Semipalmated Plover, Western Sandpiper, Least Sandpiper, and Short-billed Dowitcher.



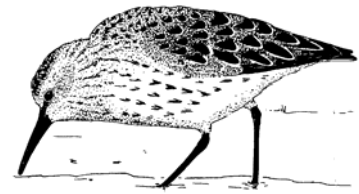
#### **Shorebird Monitoring at Totten Inlet, Washington**

Contact: Joseph B. Buchanan, Washington Department of Fish and Wildlife, 360-9022697 or [buchajbb@dfw.wa.gov](mailto:buchajbb@dfw.wa.gov)

Totten Inlet is a small inlet at the southern end of Puget Sound, Washington. Although a relatively small site compared to some estuaries in northern Puget Sound, Totten Inlet ranks in the top 6-8 sites in Puget Sound in terms of total shorebird abundance, and in abundance of Black-bellied Plovers and Dunlins. This monitoring effort is an ongoing project to refine understanding of local migration timing and to track changes in shorebird abundance over time. The site has been regularly visited for much of the period between 1978 to date. Survey effort was most intensive between 1980 and 1988 and again between 1999 and the present, and less so in other periods.

The abundance of several species has changed over varying time periods. For example, numbers of Killdeer (autumn), Greater Yellowlegs (all seasons) and Western Sandpipers (spring) have declined. The Killdeer and Western Sandpiper data appear to track changes noted elsewhere in the region, whereas changes in Greater Yellowlegs numbers may reflect a shift from the site to another area nearby. In contrast, the abundance of Black-bellied Plovers has increased dramatically in all seasons since the mid-1980s. All indications are that this increase is unique to the site, and correlative data suggest a relationship with an increase in the chum salmon run in Kennedy Creek (a paper describing this information will soon be published). Totten Inlet has recently supported several hundred Black-bellied Plovers in all seasons, and over 1000 have been observed in spring; these data suggest that this has become perhaps the most important Puget Sound site for this species. The abundance of migrant and wintering Dunlins appears stable over the last 2+ decades.





### **Shorebird Monitoring in the Greater Skagit-Stillaguamish Delta**

Contact: Roger Fuller, The Nature Conservancy, 360-419-0175 or [rfuller@tnc.org](mailto:rfuller@tnc.org)  
Gary Slater, Ecostudies Institute, 360-416-6707 or [gslater@ecoinst.org](mailto:gslater@ecoinst.org)

Ecostudies Institute, The Nature Conservancy (TNC), and Skagit River System Cooperative have partnered to investigate waterbird (including shorebirds) abundance and habitat use in estuarine and agricultural habitats of the Greater Skagit-Stillaguamish Delta (GSSD) during the winter and spring migration. These areas lie adjacent to Skagit Bay and Port Susan Bay, which have both been identified as sites of regional importance by the Northern Pacific Coast Regional Shorebird Management Plan. A two-year report has just been completed and efforts to obtain additional funding to continue this work are ongoing. Shorebirds were found to be abundant in estuarine habitats, but were relatively absent from commercial agricultural lands. Results also suggest that nontidal wetlands, which have been virtually eliminated from the GSSD, are critical habitats for shorebirds.

In another component of this study, TNC and Ecostudies Institute examined shorebird habitat use at TNC's Port Susan Bay Preserve during fall migration. The Preserve consists of 4,122 acres of excellent estuarine habitat, 160 acres of which are diked upland and wetland habitat. Results of this study indicate that shorebird species are segregated by habitat type. However, at high tides when estuarine habitats were unavailable, large congregations of shorebirds were observed using the flooded upland site, which is effectively serving as a nontidal freshwater wetland. In contrast to previous studies, few shorebirds were observed using agricultural fields.

At TNC's Port Susan Bay Preserve, volunteers have continued to monitor shorebirds in the diked uplands. These data will be used in TNC's assessment of waterbird use of the preserve and are provided to the International Shorebird Survey. Volunteers survey shorebirds 2-3 times per week (stratified by tide period) throughout the year. Ecostudies Institute is helping to coordinate this program.

### **Northern Puget Sound Shorebird Monitoring**

Contact: Ruth Milner, Washington Department of Fish and Wildlife, 425-379-2310 or [milnerlm@dfw.wa.gov](mailto:milnerlm@dfw.wa.gov)

Twenty volunteers participated in a 1-day, free, training session hosted by Washington Department of Fish and Wildlife (WDFW) to teach International Shorebird Survey counting techniques and shorebird identification. Ten areas in northern Puget Sound have been identified, mapped and described for shorebird monitoring. The effort is coordinated by the WDFW, and regular counts of shorebirds using the sites will begin in spring, 2005, using the volunteers.

### **Program for Regional and International Shorebird Monitoring**

Contact: John Bart, USGS – Forest and Rangeland Ecosystem Science Center, 208-426-5216 or [jon\\_bart@usgs.gov](mailto:jon_bart@usgs.gov) (general PRISM)

Sue Thomas, USFWS – Migratory Birds and Habitat Programs, 503-231-6164 or [sue\\_thomas@fws.gov](mailto:sue_thomas@fws.gov) (OR/WA PRISM)

US and Canadian Shorebird Conservation Plan partners recently developed a comprehensive plan for shorebird monitoring in Canada and the United States. The Program for International and Regional Shorebird Monitoring (PRISM) seeks to integrate existing shorebird monitoring programs such as the International Shorebird Survey and Maritimes Shorebird Survey with standardized survey techniques and a common data center. The primary goals of PRISM are to:

- Estimate the size of breeding populations
- Describe distribution, abundance, and habitat relationships
- Monitor trends in population size
- Monitor stopover locations
- Assist local managers with shorebird conservation

PRISM takes a four-part approach to monitoring shorebirds:

- Arctic and Boreal Breeding Surveys
- Temperate Breeding Surveys
- Migration Surveys
- Wintering Surveys

To date, most of the effort has gone into breeding surveys in the Arctic and Temperate regions. Four years of surveys have been conducted in the Arctic and are now undergoing peer review. This year marks the first year in temperate breeding surveys for the Long-billed Curlew.

Migration monitoring methodology and site selection is currently underway. The development of regional assessments for migration monitoring under the auspices of PRISM has continued with the efforts of the USFWS and WDFW. Monitoring assessments for the Oregon Coast, Willapa Bay and the Northern Olympic Peninsula are available for review. Assessments for Grays Harbor and the Puget Sound are underway.

Wintering surveys are still in the conceptual phase. For more information on this effort, go to [http://wss.wr.usgs.gov/data/document\\_main.html](http://wss.wr.usgs.gov/data/document_main.html)

### **Migration Monitoring at Grays Harbor and Nisqually National Wildlife Refuges**

Contact: Marian Bailey, Nisqually National Wildlife Refuge Complex, 360-753-9467 or [marian\\_bailey@fws.gov](mailto:marian_bailey@fws.gov)

Grays Harbor is considered a WHSRN site of Hemispheric Importance, due in part to the important high tide roost and feeding site the refuge provides to shorebirds on migration. The refuge biologist and volunteers monitor the spring migration, annually tracking species and numbers using the refuge mudflats. Surveys are conducted weekly or more frequently during peak migration periods. State-owned Bottle Beach, another key high tide roosting and feeding site is surveyed approximately every 2 weeks prior to the peak migration period and more frequently during peak periods.

A Migration Monitoring Assessment for Grays Harbor under the auspices of the PRISM is underway (see previous project summary).

Refuge staff and volunteers recently assisted in an international, multi-agency, research project studying migration dynamics of Western Sandpipers in the Pacific Flyway (see Research section). They are examining migration strategies versus habitat quality through blood chemistry parameters. Staff and volunteers assisted with netting, collecting morphological data and blood samples (plasma work), taking benthic samples and tracking birds with radio transmitters. Grays Harbor along with Bandon Marsh, Oregon, were focal sites of this comprehensive research project.

### **Northern Olympic Peninsula Shorebird Monitoring**

Contact: Pam Sanguinetti, Washington Maritime National Wildlife Refuge Complex, 360-457-8451 or [pam\\_sanguinetti@fws.gov](mailto:pam_sanguinetti@fws.gov)

Washington Maritime NWR staff recently completed a draft assessment of the area for shorebird monitoring following the guidelines of PRISM. Four areas were assessed: Port Angeles Harbor, Dungeness Bay, Sequim Bay and Discovery Bay. Currently, refuge staff monitor refuge lands for migrant shorebirds and breeding Black Oystercatchers. Monitoring of exotic species such as green crabs was initiated in Dungeness Bay in 1995 and will continue again this summer.

## **Outreach and Education**

### **USFWS Outreach Activities with Shorebird Sister Schools**

Contact: Sue Thomas, USFWS – Migratory Birds and Habitat Programs, 503-231-6164 or [sue\\_thomas@fws.gov](mailto:sue_thomas@fws.gov)

The Shorebird Sister Schools Program (SSSP) is an international partnership effort 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, e-mail network, and web site. 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.

The Shorebird Sister Schools Program is thriving in the Northern Pacific Region with partners spending approximately 1,600 hours and \$10,200 on activities this year. Primary partners include USFWS Migratory Birds and Habitat Programs, Nisqually NWRC, Oregon Coastal NWRC, Americorps, Washington Department of Fish and Wildlife (WDFW), Yaquina Birders and Naturalists, Grays Harbor Audubon, City of Hoquiam, Port of Grays Harbor, Hoquiam School District, Central Elementary School, and the Ocean Shores Elementary School. Currently there are 2 permanently stationed Shorebird Education Kits available in the Region with one floating kit available within the USFWS Migratory Birds and Habitat Programs. Key activities include:

- Production of Shorebird Identification Flashcards with an emphasis on Pacific Flyway shorebirds (ongoing). 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 is designed to teach students how to identify shorebirds of the Pacific Flyway.
- The Oregon Coast NWR has been very active bringing SSSP to classrooms along the coast. Students completed a semester-long Shorebird Sister Schools program on shorebird identification, biology, and habitat use. They wrapped up the project by removing over 600 gallons of trash from a local estuary and creating “Trashpipers” from their findings!
- WDFW has also been active with SSSP, bringing the shorebird education kit into classrooms in the Northern Puget Sound. We hear that the shorebird puppets were a big hit!



### **Grays Harbor Shorebird Festival**

Contact: Marian Bailey, Nisqually NWRC, 360-753-9467 or [marian\\_bailey@fws.gov](mailto:marian_bailey@fws.gov)

The refuge and Grays Harbor Audubon hosted the 8<sup>th</sup> annual Grays Harbor Shorebird Festival in May 2004. The event featured guided field trips, a kids fair and presentations focusing on shorebird ecology, life history, and environmental education. This focus helped educate local community members about the special value of the Grays Harbor estuary for migrating shorebirds. This year, approximately 1800 visitors attended the festival. In addition, 400

students attended with 250 participating in the shorebird poster contest, the highest level of participation yet.

The refuge is very active in the Shorebird Sister Schools Program as well. Key features used are the Shorebird Education Kit and Arctic Nesting Shorebirds curriculum.



#### **Washington Department of Fish and Wildlife Outreach**

Contact: Ruth Milner, Washington Department of Fish and Wildlife, 425-379-2310 or [milnerlm@dfw.wa.gov](mailto:milnerlm@dfw.wa.gov)

Washington Department of Fish and Wildlife added shorebirds as a topic at the Washington Brant Festival, held in mid-April, 2004, by staffing an information booth and giving a lecture on shorebird identification. We hope to continue partnering with the Washington Brant Foundation to highlight shorebirds during the Brant Festival, which is held in Blaine, Washington. The festival's location and timing make it a natural place for bird enthusiasts to come and learn about shorebirds as well as the Brant that can be seen there.

#### **Oregon Parks and Recreation Outreach and Education Programs**

Contact: Michelle Michaud, Oregon Parks and Recreation, 503-986-0737 or [michelle.michaud@state.or.us](mailto:michelle.michaud@state.or.us)

Outreach activities abound with partnership efforts geared toward educating the general public about shorebirds in general and the Western Snowy Plover in particular through interpretive programs at state parks, and interpretive panels. The Oregon Parks and Recreation Department also assisted in developing of the Oregon Coastal Birding Trail brochure that identifies birding opportunities on the coast.

## Appendix 1. Scientific Names

Common Name	Scientific Name
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Black Oystercatcher	<i>Haematopus bachmani</i>
Black-bellied Plover	<i>Pluvialis squatarola</i>
Caspian Tern	<i>Sterna caspia</i>
Dunlin	<i>Calidris alpina</i>
Glaucous-winged Gull	<i>Larus glaucescens</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>
Killdeer	<i>Charadrius vociferus</i>
Least Sandpiper	<i>Calidris minutilla</i>
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Pigeon Guillemot	<i>Cepphus columba</i>
Sanderling	<i>Calidris alba</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Snowy Plover	<i>Charadrius alexandrinus</i>
Western Sandpiper	<i>Calidris mauri</i>