

# Summary of the Tenyo Maru Oil Spill Restoration



Natural Resource Trustees

Makah Indian Tribe

Washington Department of Ecology

National Oceanic and Atmospheric Administration

US Fish & Wildlife Service

# Introduction



On July 22, 1991, the cargo vessel *Tuo Hai*, owned by the Chinese company, Tianjin, collided with the Japanese fish processing vessel *Tenyo Maru*, owned by the Maruha Corporation, approximately 20 miles west of Cape Flattery. The *Tenyo Maru* sank at the point of collision in 90 fathoms of water. The *Tenyo Maru*, which was reportedly carrying over 475,000 gallons of oil, sank at collision. It initially leaked a large amount of oil and undetermined amounts were reported leaking for more than a month after the collision. Beaches were fouled with oil from Vancouver Island, British Columbia to northern Oregon. While impacts were scattered along the entire Washington State shoreline and the northern beaches of Oregon, the heaviest oiling occurred along the Makah Indian Reservation and the Olympic National Park shoreline.

A large number of birds, including common murre, Federally-threatened marbled murrelets, auklets, tufted puffins and pigeon guillemots were killed. Kelp beds from Cape Alava north to Tatoosh Island and from Tatoosh Island east to Waadah Island had substantial amounts of oil in them. Oil lingered in these giant kelp beds for up to two weeks. In Washington, there were large impacts to populations of the common murre and the Federally-threatened marbled murrelet.

The U.S. Coast Guard, the State of Washington, the vessel owners, and the Makah Indian Tribe were responsible for as much clean-up of the oil from the environment as was possible. The U.S. Fish and Wildlife Service (USFWS), the State of Washington, and the Makah Indian Tribe were responsible for the care of impacted wildlife and, along with the National Oceanic and Atmospheric Administration (NOAA) documented the injuries to natural resources. These parties formed a Trustee Committee that was responsible for planning, designing, constructing and implementing restoration projects to compensate the public for the losses as a result of the oil spill.



Cape Flattery  
OCNMS

## When Natural Resources are Injured



## What laws are applicable when there is an oil spill?

### What are injured resources?

The most immediate and visible impacts of an oil spill may be injured or dead organisms – such as fish, birds, wetland plants and sea grasses. Other impacts may not readily be apparent. Nurseries or nesting sites for birds may be destroyed and birds and other wildlife may become ill from eating contaminated food.

Injured resources may also appear in the diminishment of the recreational (e.g., fishing, boating, beach walking, and wildlife viewing) and ecological services (e.g., providing habitat, nutrient cycling, and energy transfer through food webs) that natural resources provide.

The Oil Pollution Act of 1990 (OPA) and its accompanying Natural Resource Damage Assessment and Restoration (NRDAR) process go into effect when there is an oil spill.

The goal of OPA is to make the environment and the public whole for injuries to natural resources and services resulting from an incident involving a discharge of oil. The NRDA process is the mechanism OPA provides to achieve this goal. Through this process, the Trustees work to return the injured natural resources and services to a pre-incident condition and to compensate the public for their losses.

### Who is responsible for natural resource restoration?

The NRDA process is paid for by funds recovered from the parties responsible for the oil spill and not at the expense of the taxpayer but the Trustees are ultimately responsible for ensuring that the OPA objectives are fulfilled and the natural resources are restored.

### How does the public get involved in natural resource restoration?

The Trustees rely on public input during the restoration planning phase. Restoration plans must undergo public review to ensure broad support for the actions chosen to restore the injured resources. Additionally, individual and group volunteers are often encouraged to participate in many restoration implementation activities. Because each project is localized, the best way to find more information about getting involved is to contact a local trustee bureau office or a local trustee partner.

## Approaches to Restoring the Land

In their efforts to restore the injured resources and in compliance with OPA and the National Environmental Policy Act, the Trustee Committee developed a range of alternatives for restoration approaches and activities and then identified their preferred alternative based on the standards provided by these statutes.

The primary goal of restoration in any oil spill is to compensate the public for direct injuries to natural resources and any indirect injuries as they may experience them through the services and benefits that those natural resources provide. Injury from the *Tenyo Maru* incident was clearly documented for seabirds and kelp. Therefore the goals of the Trustees' restoration plan were to restore, rehabilitate, acquire the equivalent of the natural resources, or replace specific populations of seabirds and kelp beds and their associated communities. These goals served the Trustees' primary objective of providing a functioning and sustainable ecosystem through restoration.

Embarking on this process, the Trustees developed four alternatives to restore the natural resources lost as a result of the *Tenyo Maru* oil spill. Each alternative was considered for both its benefits to the affected species in the environment as well as its possible detrimental effects to the environment. The Trustees sought and considered the public's comments in the development of the Restoration Plan/Environmental Assessment. Each alternative is briefly explained below.



Tufted puffin  
Roy W. Lowe /USFWS



Common murre  
OCNMS



Black oystercatcher  
David Ledig /USFWS

### 1) Habitat-focused Restoration

Habitat is broadly defined as both the biological and physical environment in which kelp occurs or individual seabirds breed, roost, or forage. The goal of this alternative is simply to provide quality habitat. It is assumed that the injured species and services would be restored over time if such habitat is created, protected or otherwise made available. The goal, then, of this alternative is not the manipulation of seabird population parameters but simply the manipulation and/or protection of the seabird habitats. Properly conducted projects under this alternative should have minimal, if any, negative impacts to the environment and no adverse impacts to threatened or endangered species are anticipated.

### 2) Population-Focused Restoration

Projects conducted under this alternative will attempt to beneficially affect populations of injured species by directly or indirectly manipulating one or more population demographic factors (e.g. survival, number of adults attempting to breed, age at first breeding attempt). A population's size may be increased, restored, or distribution may be altered by increasing immigration, releasing rehabilitated injured individuals, enhancing natal recruitment, and improving reproductive success at specific localities. The environmental consequences of properly conceived, designed, implemented, and monitored projects conducted under this alternative should be minimal.

### 3) No action/Natural recovery - (required by the OPA regulations and the NEPA process)

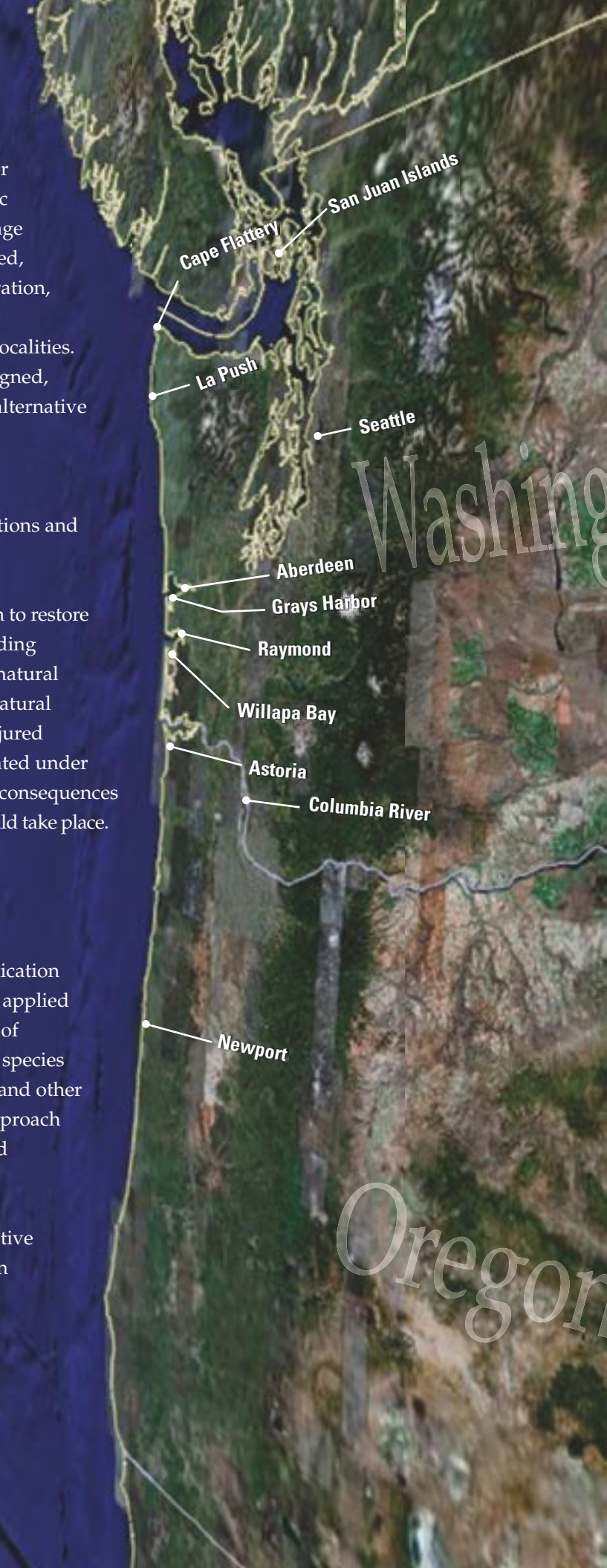
Under this alternative, the Trustees would take no direct action to restore injured natural resources or compensate for lost services pending environmental recovery. Instead, the Trustees would rely on natural process for recovery of the injured natural resources. While natural recovery would occur over varying time scales for various injured resources, the interim losses suffered would not be compensated under this alternative. This alternative has no direct environmental consequences because, by definition, no manipulations to the environment would take place.

### 4) An Integrative Restoration Approach

Using an integrative approach implies the simultaneous application of alternatives 1-3 such that each is more effective than when applied alone. The integrated approach also provides a broader scale of restoration and benefits a larger variety of rare and sensitive species by protecting and restoring nesting, feeding, resting, rearing and other forms of habitats used during the lives of the species. This approach also uses all available techniques that provide predictable and testable results.

After a process of public input, the Trustees chose the Integrative Restoration Approach to design and implement its restoration activities.

Special Thanks to Google Earth for map image.



## Restoration: Now and for the Future



### Kelp and the Kelp Community

Kelp beds produce such large amounts of carbon for their size that they are considered some of the most productive systems on earth. The canopy formed by Bull whip and giant kelp during the summer and fall shades the plants below them in the water, influencing the amounts and kinds of plants that co-exist in the kelp beds. Kelp provides food for a rich and diverse community of organisms that serve as prey for fish and invertebrates. It is also an important part of many invertebrates' diets, such as purple urchins, red sea urchins and northern abalone. Young, juvenile and adult forage fish species such as Pacific herring, northern anchovy, and sand lance are abundant in and around kelp beds and feed extensively on planktonic invertebrates associated with these beds.

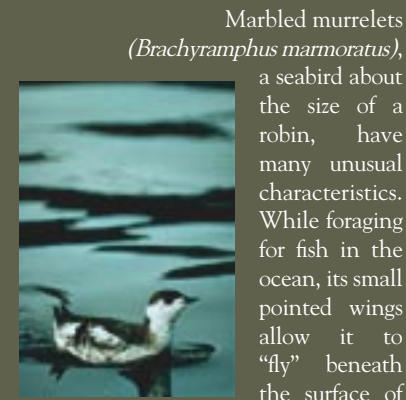
Sea otters, reintroduced to the Washington coast, have a close association with kelp beds. They feed on many of the associated organisms and use kelp to rest in (Bowlby et al. 1988). Marine birds and shorebirds, such as marbled murrelets, have demonstrated their close association with the kelp beds along the north coast and western Strait of Juan de Fuca (Thompson 1996).

Beyond their contributions to the food chain and habitat needs of marine species, Kelp plants act as active transporters of rock materials, absorb wave energy and dampen wave action, thereby influencing beach slope, stability and the material makeup of beaches. Loss of kelp may change the makeup of the beach and, consequently, the types or numbers of organisms that can use the beach.

To replace or provide a functioning and sustainable ecosystem in the area where the oil spill injuries occurred, the Restoration Plan placed special emphasis on enhancing the specific populations of seabirds and kelp beds. Implementation of restoration began during the summer of 2000. All restoration projects were directly linked, geographically and/or biologically, to the natural resources injured by the Tenyo Maru oil spill.



*Underwater Kelp Beds*  
© Steven Fisher



Marbled murrelets (*Brachyramphus marmoratus*), a seabird about the size of a robin, have many unusual characteristics. While foraging for fish in the ocean, its small pointed wings allow it to "fly" beneath the surface of the water. Aloft, the small size of the wings reduces the bird's lift, making it necessary for it to fly with a very rapid wing beat. When it lands, the bird must go into a dive, turn upside down, and stall. It is the only seabird whose nesting habitat is in old growth or mature trees. Murrelets do not build nests, rather they make shallow depressions in the moss that grows on large, old tree limbs and lay a single egg. Because of the losses in this type of coastal forest habitat, the number of murrelets has declined, leading to its Endangered Species Act listing as "threatened" in 1992.

## Habitat-focused Restoration

Permanent Protection of Marbled Murrelet Habitat and Reduction of River Silt to the Marine Ecosystem

June 2001 – 2006

A large proportion of the settlement funding was used to protect and restore over 900 acres of forest on three properties, including almost 220 acres of rare coastal old growth. 1) Teal Slough was acquired by the Trustees and is now managed by the Willapa National Wildlife Refuge; 2) Anderson Point and 3) Waatch Valley are 200-year Land Use Agreements funded by the Trustees on Makah tribal land. The acquisition and agreements permanently protect these marbled murrelet nesting habitats from logging, development, or other activities that are detrimental to marbled murrelet nesting. By protecting and providing natural restoration for these properties, silt deposits on kelp ecosystems at the mouths of streams and rivers are also reduced.

The Trustees' efforts were aimed at protecting habitats that are biologically rich and not permanently protected from detrimental use. Their preservation and restoration will protect many species of plants and animals that live in mature coastal forests.

Project costs: \$4.7 million



### THE PLIGHT OF MARINE SEA BIRDS ON THE NORTHWEST COAST

More than 72 percent of Washington's marine birds nest on the States outer coast. Sixteen species of marine birds nest here, with a total estimated population of over 218,000 birds. The most numerous species include Cassin's auklets, Leach's storm-petrels, common murres, rhinoceros auklets, glaucous-winged and western gulls and tufted puffins.

More than a dozen species of seabirds nest on the rocks and islands of the 300-mile Oregon Coast. The Oregon Islands and Three Arch Rocks NWRs provide critical nesting habitat for more than one million seabirds. Common murres are the most numerous with an estimated population of 722,500 birds (Lowe and Pitkin 1996). Other nesting seabirds include rhinoceros auklets, pigeon guillemots, tufted puffins, cormorants, and western and glaucous-winged gulls.

Prior to the Tenyo Maru oil spill in Washington, the population of the common murres, marbled murrelets and rhinoceros auklets had been of concern.

*Colony Rock, Oregon Islands NWR*  
David S. Pitkin/USFWS



Old Growth Sitka Spruce  
Roy W. Lowe/USFWS

### Terrestrial Marbled Murrelet Surveys to Protect Forested Habitat Through the Identification of Nesting Locations

April 2001 – June 2003

During the summers of 2001 and 2002, terrestrial surveys for marbled murrelet nesting habitat were conducted in coastal Washington. Identification of occupied marbled murrelet areas occurred on approximately 2,900 acres of forested habitat. These data increased habitat protection on land in areas where logging and other activities would compromise the bird's nesting habitat.

These new data for the sites were incorporated into the State's habitat database that is required to be searched prior to Habitat Conservation Plan negotiations for property development or State or Federal permit approvals. In addition, the information will be used to expand protection of marbled murrelets and their habitat under the Endangered Species Act.

Project cost: \$408,000



Tatoosh Island  
OCNMS

### Population-focused Restoration

#### Emergency Towing Vessel at Entrance to the Strait of Juan de Fuca

December 1999 – June 2000

This project covered the December 1999 – June 2000 winter season and was intended to help eliminate the risk to restoration of affected sea bird populations, kelp beds and other marine resources posed by a drifting and/or disabled vessel transiting the Strait of Juan de Fuca. The vessel's presence assisted the State in conducting drills and exercises to test coordination with existing governmental and voluntary vessel safety and response measures. These tests provided data to the North Puget Sound Risk Assessment Panel as it considered improvements to the safety of marine transportation in North Puget Sound and the Strait of Juan de Fuca and the merits of a yearly towing vessel operation.



Project Cost: \$400,000



Common murrens allopreening  
David S. Pitkin/USFWS

### Restoration of Common Murre Colonies in Copalis National Wildlife Refuge

July 2002-March 2003

The long-term goal of this project was to reestablish a self-sustaining breeding population of common murrens within the Copalis NWR.

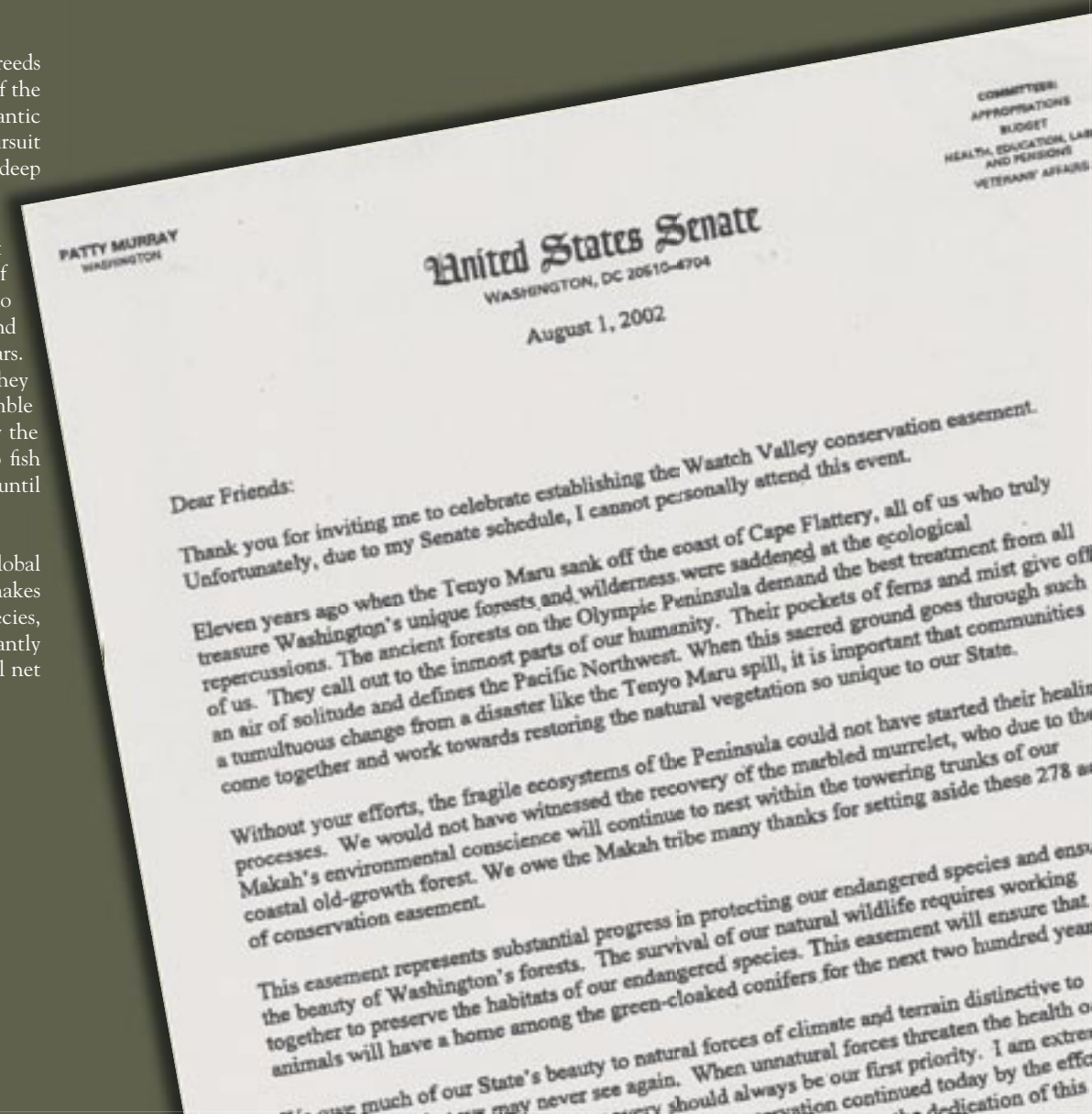
Phase I of this project determined the feasibility of using social attraction techniques to reestablish self-sustaining breeding populations of common murre colonies at former breeding colony locations in the Copalis NWR. The Trustees evaluated whether the presence of breeding common murrens could be increased at the site through a decoy project that would encourage breeding behavior, breeding activities, and breeding attempts.

The feasibility data were collected in spring/summer of 2001/2002. An evaluation of the data was conducted in the spring of 2003. The Committee concluded that Phase 2 of this project was not feasible and directed the remaining funds to the Marbled Murrelet Habitat Project.

Project cost: \$364,000

The Common murre (*Uria aalge*) is a large, diving seabird that breeds and feeds widely along the coasts of the northern Pacific and northern Atlantic oceans. They are wing-propelled pursuit divers capable of extended and deep dives. Common murrens are highly social and breed in extremely dense colonies on cliff ledges, flat low-lying islands, and the tops of offshore stacks. Murrens are loyal to their mates and nesting sites and begin breeding at the age of 4-5 years. Chicks are not able to fly when they leave their nesting site, they scramble to the sea, usually accompanied by the male parent who teaches them to fish and escorts them back to the cliffs until they can make the trip alone.

While the widespread global distribution of common murre makes them less susceptible as a species, local populations can be significantly impacted by oil contamination, gill net mortality and human disturbance.



## Public Education Signs and Brochures

July 2002 – December 2004

These projects were designed to educate boaters, kayakers, aircraft pilots and other visitors about disturbance impacts to nesting seabird colonies and the Makah Indian Tribe's culturally sensitive areas. Their purpose was to educate the public on how modifying their behavior can decrease adverse impacts on seabird productivity and survival. These public education activities complemented



existing programs managed by the Olympic Coast National Marine Sanctuary (OCNMS) and the Copalis NWR and the projects worked in coordination with outreach activities being planned by other natural resource trustees for the northern California seabird communities. This project, in conjunction with related programs in Washington and California, significantly increased public awareness along the entire West Coast of the impacts that disturbance to seabirds has on their populations and the importance of protecting these marine habitats.

Educational Posters and Panels : 6,000 posters were printed and widely distributed to marine supply stores,

marine ports and other outreach projects. Large panels (48" X 72") were installed at 11 coastal marinas along the Oregon coast. The posters and panels educate the public (primarily boaters) about the sensitivity of nesting seabirds to human disturbance and make recommendations on how to prevent disturbance when people are near colonies.

Wooden kiosks were installed at the Cape Flattery and Shi Shi Beach trailheads on the Makah Indian Reservation near Neah Bay, Washington. Each kiosk includes three panels. The Tenyo Maru panel highlights the ecology and sensitivity of nesting seabirds and the impact of past oil spills. In a coordinated effort, the other two complementary panels were produced by the OCNMS and the Makah Indian Tribe and describe the value and characteristics of the area.

Overflight Posters and Brochures: This outreach project produced high quality posters describing the impacts of low-flying aircraft to nesting seabirds. It educates Oregon pilots about conducting safe overflights of sensitive marine and seabird habitat and builds upon the Washington overflight program jointly managed by the OCNMS and the Washington Maritime National Wildlife Refuge. The posters were distributed to airports in Oregon and surrounding states.

Project Cost: \$125,000



## Commemoration Event and Final Outreach Document

August 2006

This project informs the public of the importance of the NRDA process and the benefits it provides the American public by returning injured natural resources to their pre-incident conditions. In August 2006, the Trustees completed the implementation of the Restoration Plan. With so much accomplished, they planned a celebration and commemoration event to share this milestone with the public, and to take the opportunity to further inform them of the threats and needs of Washington and Oregon's seabirds and kelp beds.

This event also dedicated two of the three forests protected with settlement funding for marbled murrelet habitat. For this reason, the event was held at Neah Bay, on the Makah Indian Reservation, near two of the forests being preserved. Dignitaries and representatives from the Trustee agencies and the Tribe, along with the interested public, were invited to the event. The Makah Indian Tribe hosted this ceremonial event with traditional singing and dancing and a salmon buffet.

As a final report and outreach product, this summary document of the NRDA process and its associated restoration accomplishments is available for distribution to further educate and commemorate a landmark event in Northwest natural resource management history.

Project cost: \$33,000



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OCNMS

## BIBLIOGRAPHY

Bowlby, C.E., B.L. Troutman, et al. 1988. Sea otters in Washington: Distribution, abundance and activity patterns. National Coastal Research Institute, Newport Oregon.

Lowe, R.W. and D.S. Pitkin. 1996. Replicate Aerial Photographic censuses of Oregon Common Murre Colonies 1995. Final report submitted to the Tenyo Maru Trustee Committee.

Speich, S.M. and t.r. Wahl. 1995. Marbled murrelet populations of Washington--marine habitat preferences and variability of occurrence. Pg. 313-326 in C.J. Ralph, G.L. Hunt, M.G. Raphael, and J.F. Piatt (ed.). Ecology and conservation of the Marbled Murrelet. Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, Albany, CA.

Thompson, C.W. 1996. Distribution and abundance of marbled murrelets and common murrelets in relation to marine habitat on the outer coast of Washington--An interim report to the Tenyo Maru Trustee Coun

