

3.0 DESCRIPTION OF RESTORATION ALTERNATIVES, PROPOSED PROJECTS, AND ENVIRONMENTAL CONSEQUENCES

3.1 Development of Restoration Alternatives

The OPA regulations require trustees to develop a reasonable range of primary and compensatory restoration alternatives and then identify the preferred alternatives based on criteria provided at 15 CFR Part 990.54(a). Primary restoration is action(s) taken to return injured natural resources and services to baseline on an accelerated time frame. Compensatory restoration is action(s) taken to compensate for the interim losses of natural resources and services pending recovery.

The National Environmental Policy Act (NEPA) applies to restoration actions taken by federal trustees. To reduce transaction costs and avoid delays in restoration, the OPA regulations encourage the trustees to conduct the NEPA process concurrently with the development of the draft restoration plan.

To comply with the requirements of NEPA, the Trustees analyzed the effects of each preferred alternative on the quality of the human environment. NEPA's implementing regulations direct federal agencies to evaluate the potential significance of proposed actions by considering both context and intensity. For most of the actions considered in this RP/EA, the appropriate context for considering potential significance of the action is regional, as opposed to national or worldwide.

Several restoration alternatives included in this section are based on conceptual designs rather than detailed engineering design work or operational plans. Therefore, details of specific projects may require additional refinements or adjustments to reflect site conditions or other factors. The Trustees assume that implementation of restoration will begin during the summer of 2000.

The primary goal of restoration is to meet the statutory objective to compensate the public for injuries to natural resources from the *Tenyo Maru* oil spill. Injury was clearly documented for seabirds and kelp from this incident. Therefore, the goals provided in this Plan are to restore, rehabilitate, or replace specific populations of seabirds and kelp beds (including their associated communities). This plan does not directly apply to fisheries because there was no documentation of injury to fishery resources in the damage assessment. The primary objective is to provide a functioning and sustainable ecosystem where specific populations of seabirds and kelp beds are enhanced to provide a net gain of habitat function beyond existing conditions.

In accordance with the consent decree, the MOA, OPA and the *Tenyo Maru* Trustee Committee's Resolution 96-1, expenditures from the *Tenyo Maru* restoration fund are limited to implementing restoration projects that meet the following minimum restoration criteria:

- 1) Restoration projects must be directly linked to natural resources shown to be injured from the *Tenyo Maru* oil spill. Seabirds, and to a lesser extent, kelp habitats, are the only resources for which there exists documented injury;
- 2) Restoration projects will be linked either geographically or biologically to the physical area where the impacts of the spill occurred;
- 3) Restoration projects will restore, rehabilitate, replace or acquire the equivalent of injured natural resources; and,
- 4) Restoration projects will be consistent with relevant federal, state and tribal laws, regulations and policies.

Pilot Projects Conducted to Assist with Restoration Planning

Some of the dollars generated as interest from the restoration fund were used to support pilot projects necessary for restoration planning. These projects also helped establish the necessary baseline from which the success of the restoration efforts can be measured. The Trustee Committee determined that projects had to enable the preparation of the RP/EA and be limited to the collection of data that would have been irretrievably lost if the project were not conducted, and was beyond normal agency work. The projects funded for these reasons were:

- 1) FWS aerial surveys of common murre colonies in Washington and Oregon. The FWS historically has conducted annual, single aerial surveys off the coast of Washington and Oregon. During each of the 1995, 1996, and 1997 common murre breeding seasons, three additional surveys were flown in Washington and two in Oregon.
- 2) Tatoosh Island common murre. Common murre productivity and reproductive success on Tatoosh Island was evaluated in 1995-97. The studies were conducted by the University of Washington, and continued similar work initiated in 1991.
- 3) Seabird prey-base study. A seabird prey-base study was conducted in 1995 as a cooperative program between the University of Washington and WDFW.
- 4) At-sea distribution of common murre and marbled murrelets. An at-sea distribution study of common murre and marbled murrelets was conducted by WDFW in 1996 and 1997.
- 5) Kelp distribution. Aerial surveys of kelp distribution were conducted in 1996 and data were analyzed from the 1994 survey.
- 6) Common murre population genetics. A population genetics analysis of common murre colonies in Washington and Oregon was conducted in 1996 and 1997 by WDFW to determine the type of restoration (including natural recovery) that would be best prescribed for specific localities.

3.2 Proposed Alternatives and Potential Projects

To restore natural resources lost as a result of the *Tenyo Maru* oil spill, the *Tenyo Maru* Trustee Committee developed four Alternatives:

- 1) No action/ Natural Recovery (required by the OPA and NRDA regulations and the NEPA process)
- 2) Population-Focused Restoration
- 3) Habitat-focused Restoration
- 4) An Integrative Approach

The following sections describe the proposed restoration alternatives, their environmental consequences, and specific projects. Work plans, detailed scopes, schedules, budgets, appropriate environmental documents, and applicable permits will be prepared for review and adoption by the Trustee Committee before implementation of any project. The project managers will ensure that all monitoring reports and data will be shared among all the selected projects to ensure a more comprehensive picture of the effects of those activities on the bird and kelp species being restored under this restoration program. Public review and comment of the alternatives was conducted for a minimum of 90 days. The alternatives are defined and a selected alternative is named in Section 4. Project proposal schedules and estimated budgets are provided in Section 4.1.

3.2.1 Alternative A: No-Action/Natural Recovery

NEPA requires the Trustees to consider a “no action” alternative, and the OPA regulations require consideration of the equivalent, the natural recovery option. 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 processes 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 the no-action alternative. The no-action alternative has no *direct* environmental consequences because, by definition, no manipulations to the environment would take place. Furthermore, natural recovery is threatened by the risk of further oil spills in the affected area.

3.2.2 Alternative B: 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 rate of seabird population growth is a function of net immigration-emigration, survival, and productivity (i.e., reproductive success); restoration projects conducted under this alternative will focus on these population parameters. As with seabirds, populations of kelp are also affected by rates of survival, reproductive success and immigration-emigration.

Specific project proposals consistent with the population-focused restoration alternative are identified in Sections 3.2.2.1 through 3.2.2.3. Although any manipulation to a wild population may have unforeseen consequences to that population or to the ecosystem to which that population is a part, the environmental consequences of properly conceived, designed, implemented, and monitored projects conducted under this alternative should be minimal. Under this alternative, no adverse impacts to threatened or endangered species are anticipated, however, the appropriate consultations under the Endangered Species Act will be pursued for projects that may affect federally listed species.

3.2.2.1 Restoration of Common Murre Colonies in Copalis National Wildlife Refuge, Washington

Purpose(s): The purpose of this project is to restore common murre colonies, using social attraction techniques, to locations in the Copalis NWR that are not used now for breeding, but traditionally were the locations of the largest breeding colonies in Washington State.

Project goals: The goals of this project are to increase the presence of murres at the site, elicit breeding behavior, breeding activities, and breeding attempts. The long term goal is to reestablish a self-sustainable breeding population within the Copalis NWR.

Potential project coordinators: U.S. Fish and Wildlife Service and Washington Department of Fish and Wildlife

Project description: This project assumes that the reason common murres are not attempting to breed at the chosen site is the result of low population numbers and/or behavioral phenomena associated with the social aspects of common murre colony dynamics. Social attraction is a restoration technique that uses decoys, sound recording, and other devices to attract potential recruits to a specific location or habitat. The technique works much the same way “traditional” waterfowl decoys work in that decoys, sound recordings, and other devices (e.g., mirrors) are placed in a way that mimics an active breeding colony, sub-colony, or social aggregation. Aerial surveys during 1997-1998 indicated larger numbers of murres attending some of the colonies in the Point Grenville area of the Copalis NWR. Small numbers (5-10) of murre chicks were observed. Phase I information will be used to intensively assess the status of these colonies over a two-year period. The information gathered during Phase I will be used to determine whether Phase II should be implemented. This project may be determined infeasible if

implementation would interfere with natural breeding efforts or if factors other than the lack of social cohesion are resulting in a lack of breeding efforts at these sites.

Phase II would involve the deployment of common murre social attraction devices at historical breeding colonies within the Copalis NWR.

Proposed activities:

Phase I - Feasibility Study

The purpose of Phase I is to assess the potential effectiveness and feasibility of the project. This would involve two years of data collection to determine if: (1) social attraction enhancement activities are warranted, and (2) project implementation would be impeded by physical or natural limitations. No decoys will be deployed during Phase I. Several observation points at Point Grenville will be established. Sites will be monitored to determine if common murre breeding is currently occurring at any of the potential sites or any other colony rock in the vicinity. Monitoring will also determine if disturbance (by eagles or any other natural or anthropogenic activities), and not the lack of social attraction, is preventing breeding and whether the disturbance can be managed. Because breeding activity may be occurring on sides of the rock not visible from the shore, boat and aerial surveys of the areas will also be conducted to assess attendance and breeding status.

Project Criteria

Data will be gathered during Phase I to address the following criteria that would evaluate the need to proceed with Phase II. Phase II of the project will be implemented only if:

- 1) findings of Phase I indicate that common murres are not self sustaining within the colony identified for restoration;
- 2) social attraction methods are deemed to have a reasonable likelihood of success based on Phase I findings;
- 3) social attraction devices can be deployed in a manner safe for humans and all necessary access permission is obtained;
- 4) rock(s) in which social attraction devices are to be deployed allows adequate monitoring of common murres and other seabirds for attendance, breeding behavior, and reproductive success, and;
- 5) it is compatible with Refuge purposes at Copalis NWR and surrounding Refuges, i.e., it will not materially impair the management of migratory birds, including common murres and other migratory species.

* The Trustee Committee may have additional requirements in the work plans and detailed scopes of work for this and other projects.

Phase II should be implemented if the results from Phase I suggest that:

- 1) social attraction techniques are a viable option at these sites,
- 2) the sites can be adequately monitored for behavioral interactions with the attraction devices and,
- 3) the sites can be adequately monitored for reproductive success. If carrying out Phase II is not feasible or beneficial, the remaining funding will be redistributed to either the Marbled Murrelet Habitat Protection and River Silt Reduction Project (Section 3.3.1) or potentially a tufted puffin restoration project. If a tufted puffin restoration project proposal is pursued, it will be provided to the public for review and comment prior to a decision by the Trustee Committee to implement.

Phase II

Phase II would deploy the social attraction devices and monitor the results. Roughly 200-500 life-sized common murre decoys, in standing and incubation postures, would be placed at a single site. Decoys will be arranged in clusters, with the size and spacing of each group dependent on the topography of the site, and based on preliminary results from other similar projects, such as the *Apex Houston* restoration project, managed by the FWS for the OPA Trustees (USFWS 1995). In addition to decoys, mirrors and omnidirectional weather resistant loudspeakers will be placed throughout the site. The loudspeakers will broadcast common murre vocalizations typically heard at breeding colonies.

Benefits: This specific project benefits common murre populations, injured by the *Tenyo Maru* oil spill, by attempting to increase the number of birds breeding at a specific habitat. It alters seabird behavior to entice the murres to resume breeding within the Copalis NWR where historically large breeding colonies existed. Affecting immigration potentially may be the easiest and fastest way of increasing a population if there are mechanisms by which individuals can be brought or attracted to an area (social attraction). Facilitating relocation of otherwise non-breeding murres to locations where large breeding colonies historically occurred is expected to have a beneficial impact on the species' population.

Environmental consequences: The restoration of seabird populations will proceed by increasing the number of individual seabirds that attempt to breed. The project *actions* taken under this alternative are designed to increase the rate of immigration, decrease the age at which individuals first attempt to breed, and increase the probability that an adult bird will attempt to breed during any given year, at a particular site. As such, this project provides the mechanisms for relatively rapid colonization and restoration at localities where breeding does not occur, or is severely depressed. Project restoration goals are for nesting murres to increase to a level that would create self-sustaining and viable colonies at target locations.

This project has little or no impact upon other injured resources or resources of concern. Adverse impacts to wildlife could occur as there is some potential for actions that benefit one group of species to have short-term impacts on other species. For example, as the number of individual murre in a specific colony expands, prey fish may be impacted short-term. Raptors may be affected in the short term either negatively by reducing the potential prey base (breeding colony murre) at the translocation site or positively by increasing the potential prey base at the relocation site. A potential negative consequence of this action would be that birds are lured from a more optimal breeding locality to breed at a potentially sub-optimal site. However, it is very unlikely that an entire successful colony would move, so any negative impact would be minimal.

Any environmental consequences associated with population manipulation would be minimal and short-term.

Project goal monitoring: This project includes intensive monitoring of attendance, breeding productivity, and other bird activity at the site and sub-colonies in the vicinity. Intensive monitoring of the restoration site, productivity monitoring compared between Pt. Grenville and Tatoosh Island (reference site), and murre population monitoring (beyond what would normally be conducted by the refuge) would be conducted.

3.2.2.2 Oiled Wildlife Rehabilitation Center

Purpose: The purpose of this project is to provide base funding so that additional funds can be secured and used to improve the capability to rehabilitate oiled wildlife (primarily seabirds) in western Washington.

Project goal: The goal of this project is to improve the State of Washington's ability to rescue, rehabilitate, and release oiled wildlife. This project is premised on the State of Washington securing the remaining funds from other sources to build a permanent rehabilitation facility in the South Puget Sound area and to develop a primary care facility at Neah Bay.

Potential project coordinator: Washington Department of Fish and Wildlife

Project description and activities: Since the *Tenyo Maru* oil spill, Washington has become a leader in the field of oiled wildlife rescue and rehabilitation. Unfortunately, the rehabilitation center, a major component of the state's wildlife rescue and rehabilitation program, has been leased out by the owners for other purposes and will no longer be available for use as a rehabilitation facility. The loss of the facility has suddenly nullified Washington's ability to rescue, rehabilitate, and release oiled wildlife.

This project proposes to provide some funding to the State to help build a rehabilitation center in the South Puget Sound area. The center would operate under the protocols of the Washington Wildlife Coalition. The Washington Wildlife Coalition was convened, and is chaired, by the Washington Department of Fish and Wildlife as required by Section 12 of the 1990 Washington

State Legislature House Bill 2494 to plan and coordinate the rescue and rehabilitation of wildlife injured or endangered by spills of oil or other toxic substances. It comprises members and advisors from state and federal agencies, environmental organizations, and industries that have responsibilities, expertise, or interests in the protection of wildlife resources. The proposed rehabilitation center could receive oiled birds from any primary care station in Washington or Oregon and provide long-term care for oiled wildlife to prepare them for release back into their natural environment.

This center would also be used to research more effective techniques for cleaning oiled wildlife to maximize the survival rate, especially when rehabilitating threatened and endangered species. When not working with oiled birds from a spill, the center may be used for informational and educational outreach as well as a training facility for wildlife rehabilitators, researchers, and veterinarians.

In addition to a long-term care facility, a 40-foot, primary care trailer, stocked with appropriate primary bird care supplies would be provided at Neah Bay. This trailer would be permanently positioned on the Makah Reservation at Neah Bay to provide immediate care for oiled birds in case of another oil spill there. The primary care facility would give emergency care to oiled animals and stabilize them for transport to the rehabilitation center. A pole-barn type roof would be built over the trailer for long term protection from the elements. This primary care station would operate under the direction of the Washington Wildlife Rescue Coalition during oil spills.

Members of the oil or shipping industry that contribute matching funds for building and maintaining the center may be able to use the center at a reduced rate if they have a spill. Oil spillers that did not contribute to the center will likely pay the standard daily rate. Monies collected will be used for operations and maintenance. Any funds collected that exceed the operations and maintenance costs will be placed in a Seabird Restoration/Research Account. The funds from this account would be used to gain a better understanding of Washington's seabirds and to explore new techniques for assuring their survival.

Project Criteria

Minimum qualifications for the project to proceed involve the procurement of final project funds within three years of the release of the final restoration plan. If matching funds are not secured within this time, the funds will be redistributed to the Marbled Murrelet Habitat Protection and River Silt Reduction project (Section 3.2.3.1).

Benefits: To increase the rate of population growth (or to stabilize or reverse a population decline), immigration, survival at any or all age classes, reproductive success, and probability of breeding must be increased. Successfully rehabilitating and releasing oiled seabirds may contribute to population recruitment and stabilization.

Environmental consequences: The intent of this project is to provide a starting point to act as a catalyst for the Washington Wildlife Coalition to secure funding for a wildlife rehabilitation center and a primary care facility. The majority of the funding for this project is to come from

outside sources. The overall contribution (\$500,000) to the development of the facilities from *Tenyo Maru* funds is about one-fourth of the cost of the center (roughly estimated at \$1.8 - \$2.2 million). In addition, this project also provides for excess user fees to be returned to seabird restoration/research projects.

The environmental consequences associated with providing a catalyst for the collection of additional funds to support wildlife rehabilitation is expected to be minimal. A separate environmental assessment or environmental impact statement (EIS) will be conducted by the State for any rehabilitation facility construction activities. There is a slight possibility that adverse impacts, such as disease, could occur to wildlife from the activities associated with rehabilitation and release of wild animals. Rehabilitated animals may play a vital role in maintaining and improving their species populations and in providing function to the ecosystem. Under this alternative, no adverse impacts to threatened or endangered species are anticipated. Restoring populations through rehabilitating individuals and returning them to the wild population is expected to benefit the species directly.

Project goal monitoring: The Washington Wildlife Rescue Coalition will provide interim reports to the *Tenyo Maru* Trustee Committee on the success of securing additional funds for the rehabilitation facilities and on the process of improving Washington's ability to rescue, rehabilitate, and release oiled wildlife.

3.2.2.3 Public Education Signs and Brochures

Purpose: The purpose of this project is to inform boaters, kayakers, aircraft pilots, and other visitors about disturbance impacts to nesting seabird colonies and Makah culturally sensitive areas and educate them on how to avoid such disturbances.

Project goal: The public with access to seabird colonies will become informed about the negative impacts of human disturbance on seabird productivity and survival. Through education, individuals may modify their behavior that would cause a decrease in disturbance of seabirds.

Potential project coordinator: Olympic Coast National Marine Sanctuary

Project description: An education campaign using on-site interpretation and publications would be developed to describe the wildlife using the coastal NWR islands in Oregon and Washington, and the Olympic Coast National Marine Sanctuary (OCNMS) in Washington (including NWRs and Tatoosh Island). The campaign will focus on messages of the value of protected coastal habitats, seabird colonies, why these islands and wildlife are protected, how to avoid human disturbance, and tribal bird terms. The campaign will build on current education efforts in OCNMS in areas of reducing impacts from aircraft overflights. It will build upon multi-agency interpretation and education programs currently operated among FWS, Washington State Parks (WSP), Olympic National Park (ONP), and OCNMS. The campaign will also complement and enhance FWS education efforts underway with *Nestucca* oil spill restoration funds.

Proposed activities:

1) Interpretive planning. Education program representatives from FWS, NPS, WSP, OCNMS, coastal tribes and other potential partner agencies and organizations will identify needs, opportunities and critical gaps in existing information and education programs. Some of this assessment has already been conducted (OCNMS 1999). The group will also assist in the development of strong marine resource protection and restoration messages that will be effective with specific target audiences and assist in the design of methods to monitor the effectiveness of the education campaign.

2) Signs. Signs would be placed where boaters have access to marine waters near seabird nesting colonies. *Tenyo Maru* oil spill restoration funding would be used at eleven ports along the Oregon Coast from the Columbia River south to Brookings, Oregon and at Tatoosh Island, in OCNMS. Signs will be posted at marinas and not on a NWR. This project will coordinate with Nestucca oil spill restoration funding to address the remaining Washington Coast.

3) Publications. Brochures and other printed material would be developed and distributed to visitors and users of the marine environment, including recreational users (kayakers, sportfishers, divers, private pilots etc.) and commercial users.

Benefits: It has been documented that seabird reproductive success is reduced through disturbance resulting from human intrusion into colonies (Anderson and Keith 1980; Anderson 1988; Hunt 1972; and Kury and Gochfield 1975). Boats, private and military aircraft, and people have been observed near or on nesting islands. Birds and mammals have been observed leaving the islands in panic flights as a direct result of these disturbances (Parrish 1998). The effects of disturbance on seabirds has been documented and includes loss of eggs, loss of chicks, abandonment of nesting sites by adults, and increased vulnerability to predation (Parrish 1996, 1998; Paine et al 1990; Dixon 1997). The frequency of disturbance is not well documented but is expected to increase as coastal recreational opportunities increase. As the disturbance of common murre colonies is reduced and/or prevented, common murre reproductive success may increase. Reduction of disturbance may also benefit other species that use the islands.

Reducing human disturbance at seabird breeding colonies through educational efforts may increase the number of breeding adults and is another example of how controlling human impacts could complement a population-based approach.

Environmental consequences: This project is designed to ease the pressure applied to the environment from human disturbance. Overall habitat quality, and subsequently habitat functionality, may be improved and strengthened from this project.

The indirect consequences of carrying out this project include a greater understanding of human interaction with natural resources, and the consequences of our actions. It is hoped that the educational efforts will result directly in a decrease in disturbance at breeding colonies that should result in increased reproductive success of common murres at coastal Washington and

Oregon breeding colonies. An increase in reproductive success may lead to greater numbers of breeding common murre in Washington and Oregon which will maintain species diversity and aid in restoring common murre populations to their pre-spill levels.

The proposed project includes interpretive signs that should make the public more aware of the environment and the impacts they may unintentionally cause. Although not anticipated, there is a slight potential that the interpretive signs could draw attention and more frequent visitors. The signs will be designed to educate, to increase awareness of disturbance impacts, and not to attract visitors. Any negative environmental impacts of the educational project are unlikely.

Project goal monitoring: Project monitoring would involve evaluating the effectiveness of the education campaign through a variety of techniques, including measuring audience exposure to project messages, changes in audience awareness and knowledge of seabirds and coastal habitat and documenting changes in audience behavior regarding seabirds.

3.2.3 Alternative C: Habitat-Focused Restoration

Habitat is broadly defined as both the biological and physical environment in which kelp occur or individual seabirds breed, roost, or forage. Under this alternative, projects would be designed to restore, enhance, replace and/or acquire habitats that provide benefits to a range of natural resources injured from the *Tenyo Maru* oil spill. In this sense, 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. For example, the protection and/or manipulation of seabird habitats may positively affect seabird population parameters by increasing the number of breeding adults, increasing reproductive success, and/or increasing survival of individuals of all age classes. However, the goal of this alternative would not be the manipulation of these seabird population parameters (see Alternative B), but simply the manipulation and/or protection of the seabird habitats.

Specific project proposals consistent with the habitat-focused restoration alternative are identified in Sections 3.2.3.1 and 3.2.3.2. Although this project proposes to restore habitat, any habitat manipulation may have unforeseen consequences. Since the objective of this alternative is to provide quality habitats such that natural processes may result in the recovery of populations, the environmental consequences of properly conceived, designed, implemented, and monitored projects conducted under this alternative should be minimal. Under this alternative, no adverse impacts to threatened or endangered species are anticipated, however, the appropriate consultations under the Endangered Species Act will be pursued for projects that may affect federally listed species. NEPA compliance and reviews will evaluate whether there may be inadvertent environmental impacts affecting the quality of the human environment.

3.2.3.1 Marbled Murrelet Habitat Protection and River Silt Reduction

Purpose: The purpose of this project is twofold. One is to permanently protect marbled murrelet nesting habitats in Washington State and the second is to reduce silt deposits on kelp ecosystems at the mouths of streams and rivers in or near the kelp ecosystems affected by the *Tenyo Maru* oil spill. Projects could be combined marbled murrelet habitat protection and silt reduction (preferred), marbled murrelet habitat only, or silt reduction projects only. Because primary injury was documented for seabird injuries, the driver for selecting projects will be protection of marbled murrelet nesting habitat and buffer areas. The secondary consideration will be reducing siltation.

Project goals: The goal of the marbled murrelet component is to permanently protect marbled murrelet nesting habitat and/or forest stands next to marbled murrelet nesting habitats. This permanent protection would occur at habitats not presently protected under other regulation and are at risk of being logged or where permanent protection will significantly enhance the future habitat availability for marbled murrelets.

A second goal is to reduce the amount of silt being deposited on the kelp ecosystems off the mouth of streams or rivers in or near the area impacted by the *Tenyo Maru* oil spill. Accepted silt reduction projects would be above and beyond what is required by other regulations and programs to reduce siltation into streams and rivers.

Potential project coordinators: U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and Washington Department of Natural Resources

Project description: Section 1.2 describes impacts of the *Tenyo Maru* spill on the federally threatened marbled murrelet population in Washington. According to the Recovery Plan for the Marbled Murrelet (USFWS 1997), the major factors contributing to their threatened status include:

- 1) loss of nesting habitats, and

- 2) poor reproductive success in the habitat that does remain. In the Pacific Northwest, marbled murrelets forage almost exclusively in the near shore marine environment, but fly inland to nest in mature conifers. One component of this proposed restoration project is to permanently protect and improve marbled murrelet nesting habitats. Besides protecting marbled murrelet nesting habitats, nesting success can be improved by protecting forest stands adjacent to nesting habitats. The marbled murrelet recovery plan (USFWS 1997) recommends decreasing habitat fragmentation by increasing the size of suitable forest stands to provide a larger area of interior forest conditions as a long-term strategy. It also recommends the protection of “recruitment habitats” to enlarge existing stands and buffer occupied sites from predators and wind damage that can gradually degrade the stand.

Kelp was also documented to be injured by the *Tenyo Maru* oil spill. Surveys by the Washington Department of Natural Resources have shown losses of *Macrocystis* and *Nereocystis* beds off the mouths of some northwest Olympic Peninsula rivers in recent years (Van Wagenen 1989-1997; Van Wagenen 1995). Siltation can cause a decrease in kelp populations by:

- 1) increasing turbidity, therefore decreasing the photic zone;
- 2) covering otherwise suitable substrates with a layer of fine silt preventing recruitment of microscopic phases of gametophytes or sporophytes;
- 3) covering boulders or bedrock with finer substrates such as sand or gravel; or
- 4) smothering of either gametophytes or sporophytes (Dean and Devsher 1983; Devlinny and Volse 1978; Schiel and Foster 1992; Shaffer and parks 1994). The second component of this proposed restoration project involves sediment management projects for selected watersheds to reduce undesired siltation flows through, and deposition in, potential kelp habitat sites in the adjacent near shore areas.

Proposed activities: Fee title acquisition, easements, and other available conservation measures would be used to secure protection in perpetuity for known occupied marbled murrelet nesting habitat and/or nesting habitat buffer areas. Marbled murrelet surveys may be conducted where occupied habitat information is lacking. Priority would be given to property that maximizes the acreage protected with available dollars. Stands of mature hemlock with mistletoe would provide marbled murrelet nesting habitats, but would be of lower timber value, thereby reducing the cost. Criteria to be used for the selection of buffer areas are:

- 1) the buffer area would be adjacent to a forest stand occupied by marbled murrelets;
- 2) the occupied stand is in protected status from timber harvest;
- 3) the land is available to be acquired through fee title purchase, an easement, or other conservation measure. Buffer areas could be managed to enhance the expansion of nesting habitats through forest manipulations. Even age stands could be manipulated to accelerate late successional structures. It is possible that direct tree manipulations could be conducted to increase nesting platforms. Protection of marbled murrelet habitats that reduces the impact of siltation into river systems, as well as protecting nesting areas, will be prioritized. The Trustee Committee has not selected marbled murrelet nesting habitat protection project sites at this time. They would be identified through working with agencies and organizations interested in protecting nesting sites. The U.S. Fish and Wildlife Service would be consulted regarding activities underway with the Forest Recovery Plan.

The kelp component of this project is multi-phased. Phase I would identify and prioritize major sources of erosion that produce excessive silt. Local government agencies, tribes, private conservation organizations and landowners will be contacted for input. Phase II will involve

implementing projects. Only projects that are not already required by regulation or other programs will be pursued. Projects may include, but are not limited to, repairing failing roads, correcting small slides, placing large organic debris for bank protection, and buying or securing conservation easements for riparian buffer zones. The project coordinator(s) will pursue additional funds from other sources to complete any large projects that are approved. All funds must be available before the project can begin.

Habitats and projects where cost-sharing is available would have highest priority for both marbled murrelet habitat and siltation reduction components of the project.

Project Criteria for Marbled Murrelet Protection

Marbled murrelet surveys must be completed within a two-year period. The purchase process must begin within approximately one year of the survey results.

Project Criteria for River Silt Reduction

Phase I (feasibility) portion of the silt reduction component must be completed within six months of the release of the final restoration plan. In addition, the following criteria must be met in sequence according to criteria number, prior to the selection of a project.

- 1) If major erosion is found, is there another regulatory mandate that addresses the issue? If no, then proceed to step 2.
- 2) Is there a kelp linkage? If yes, proceed to step 3.
- 3) Is habitat currently unprotected? If yes, proceed to 4.
- 4) Submit the project proposal for Trustee Committee consideration.

Benefits: The Trustee Committee emphasizes that habitat protection is one of the most important activities that can be conducted under this alternative. Because land development or certain management methods may alter habitats so injured resources are negatively affected, the protection or enhancement of these habitats may reduce the potential for further injury, and by that allow recovery to continue for marbled murrelet and kelp with little interference.

Environmental consequences: The protection, acquisition, and enhancement of fish and wildlife habitats have been relatively successful in restoring or maintaining fish and wildlife populations. In fact, the enhancement of coastal habitats and the resulting improvement to various ecosystem functions has been the primary method for conducting coastal aquatic restoration over the past 15 years (Simenstad and Thom 1992). The protection of habitats also would reduce the probability that these habitats would become fragmented. Fragmented forests are cited as a major reason for the decline of the marbled murrelet (USFWS 1997).

Decreasing siltation in rivers and streams could, in turn, decrease the sediment load into the marine environment from the watersheds. Besides a possible increase of kelp beds near the targeted watersheds, habitat for salmonid species and forage fish could be enhanced. An enhanced kelp community offers more forage habitats for salmonids and other forage fish, urchins, and subsequently sea otters and seabirds. Potentially negative impacts that may result from kelp restoration conducted under this alternative would be the redistribution of sediment and soil materials and a change in the processes that affect erosion and deposition. These would be slight short-term impacts that include a temporary increase in sedimentation during construction which would be mitigated with timing restrictions, silt fences, etc. The Trustee Committee does not anticipate these potentially adverse effects to have long-term significance. However, project-specific impacts will be evaluated on a case-by-case basis. Finally, one disadvantage of this alternative is that it may take many years before the injured populations respond to the improvements to their habitats.

The Trustee Committee assumes that this project will result in an overall benefit to the entire suite of injured resources, with relatively few negative impacts.

Project goal monitoring: Marbled murrelet nesting habitat occupancy surveys would need to be conducted minimally for two years at five year intervals to monitor site occupancy (4 years of monitoring over a 10-year period). Buffer areas should, at the minimum, maintain occupied sites where appropriate habitats would have diminished without the buffer protection, and may improve conditions for occupied sites and serve as habitat expansion areas in the future. Monitoring will be included in the projects and an annual report will be provided to the Trustee Committee for their review and approval.

3.2.3.2 Protection of Marine Environments By Stationing an Emergency Towing Vessels at the Entrance to the Strait of Juan de Fuca

Purpose: The purpose of this project is to help fund efforts to achieve two objectives. First, to provide timely and effective protection of the Trustees' efforts to restore coastal environments, including the seabird populations and kelp beds affected by the *Tenyo Maru* oil spill at a time when technological and climatic factors combine to create a high risk atmosphere. And second, to collect data on the feasibility and effectiveness of permanently stationing an emergency response vessel in the area during high-risk seasons to limit the pollution risks presented by high-risk vessels. Monies from the *Tenyo Maru* Restoration Fund would be added to any funds secured by other agencies during 1999-2000.

Project Goals: The project goals are to eliminate or mitigate the risk to restoration of affected sea bird populations, kelp beds and other marine resources posed by a drifting and/or disabled vessel from December 15, 1999, through at least April 30, 2000, to possibly conduct drills and exercises to test coordination with existing governmental and voluntary vessel safety and response measures; to develop protocols for permanently stationing and deployment of a multi-purpose emergency response vessel; and to collect data on the operation, effectiveness, utility and cost of such a permanent emergency response vessel for the Strait of Juan de Fuca. The data collected

will be used by the North Puget Sound Risk Assessment Panel as it considers improvements to the safety of marine transportation in North Puget Sound and the Strait of Juan de Fuca.

Project coordinators: Washington State Department of Ecology and Makah Indian Tribe.

Project Description: This project will contribute funds that will allow the establishment of an emergency towing vessel in the Strait of Juan de Fuca during the 1999-2000 winter season. There are four necessary elements or roles involved in the emergency towing system: the salvage/towing vessel, the operator, the dispatcher, and the “project” partners.

Project Partners would include the state of Washington and the Makah Indian Tribe. The partners will be responsible for obtaining use of the vessel and the cooperation of the U.S. Coast Guard or other dispatching agency. The U.S. Navy has contracted with a towing company to have a tug stationed at Neah Bay for the period of December 15, 1999 through at least April 30, 2000, to be available for assisting public vessels in distress. Under the Navy contract, the tug could be made available to assist other vessels using other sources of funding. Project Partners will be responsible for working with the Navy to obtain the use of this vessel or another vessel as needed.

The partners in cooperation with the dispatching agency would develop protocols for dispatch, data collection, and drills and exercises, as well as develop a comprehensive operations plan for the vessel. Partners will function as an information source and liaison with the North Puget Sound Risk Assessment Panel.

Concept of Operations The desired period of operation is December 15, 1999 through at least April 30, 2000. The area of operation will be determined by the Partners in consultation with other affected agencies. The determination will focus on the area affected by the *Tenyo Maru* oil spill. It will encompass the start of the international traffic separation scheme as well as coastal waters on both sides of the international boundary in the Western Strait of Juan de Fuca and the Pacific Ocean. Weather and sea state conditions will be established to ensure the safety of the vessel while maintaining a high degree of coverage and effectiveness. Responses beyond the boundary of the area of operation may be allowed under specific conditions defined by the Dispatch protocols.

The vessel will be on call 24 hours per day, 7 days per week, for emergency towing and salvage response to vessels in distress or that pose a high risk as determined under the Partners protocols. Dispatch will be by the U.S. Coast Guard Puget Sound Captain of the Port/ Vessel Traffic Service or other similarly capable agency.

Proposed activities: Activities funded will fall into two categories: response and drills/exercises. Vessel activities may also include drills and exercises as needed to test and evaluate the system’s efficacy.

Benefits: The specific benefit is increased protection of efforts to restore resources affected by the *Tenyo Maru* oil spill including sea bird populations and kelp beds on the coast and in the Strait of Juan de Fuca. The Olympic Coast and Strait of Juan de Fuca serve as an entry and exit point for ships transiting to and from the ports of Puget Sound and British Columbia. In 1998, 12,376 vessel transits were observed at the entrance to the Strait of Juan de Fuca (Galasso, in press). Marine traffic in the area is largely commercial in nature, the majority comprised of bulk carriers and large tank vessels carrying significant amounts of bunker fuel or transporting hazardous substances such as crude and refined oil. While improvements to marine safety have been systematically phased in over the last ten years, this is an area identified as the most vulnerable to an oil spill or threatened spill because of the difficulty of implementing current response strategies and the area's geographic remoteness (Department of Transportation 1997). In addition, the area is subject to violent winter storms and strong currents, increasing the potential for human error and ship system failures. The Volpe study concluded that "spill prevention must be the main focus of a risk management strategy. In spite of advances in response technology, most spilled oil remains in the environment even under the best cleanup conditions". The marine resources of the area, especially seabird populations and kelp bed, were significantly affected by the *Tenyo Maru* spill and are the focus of other restoration projects in the plan. Prevention of future oil spills is clearly the most effective strategy to protect the Trustees' efforts to restore the natural resources affected by the *Tenyo Maru* spill. The marine resources of this area, especially seabird populations and kelp beds, were significantly affected by the *Tenyo Maru* spill and are the focus of other restoration projects in this plan. In this area, prevention is clearly the most effective strategy to protect the Trustees' efforts to restore the natural resources affected by the *Tenyo Maru* spill from future oil spills.

A secondary, yet important, benefit is the collection of data to be used in evaluating the feasibility of a permanent dedicated multi-purpose emergency response vessel that includes spill response, fire-fighting and salvage capability. Dedicated response vessels exist to protect waters off the coast of Britain, in the Gulf of Alaska, and in other international waters. The information collected here will assist the North Puget Sound Risk Assessment Panel in comparing and identifying measures to enhance the protection of marine waters in the Strait.

Environmental consequences: This project will have little or no adverse impact on natural and cultural resources at risk. Any adverse environmental impacts from vessel operations are likely to be similar to those of other medium sized vessels operating in the area. However, the vessel will protect other efforts to restore natural resources injured by the *Tenyo Maru* oil spill and has the potential to prevent or substantially reduce the significant or catastrophic impacts of another oil spill during the project period.

Project goal monitoring: The Washington State Department of Ecology will provide a preliminary report to the Trustee Committee by April 30, 2000, with a final report due to the Trustee Committee by June 1, 2000. The report should include information on the number of responses during the stationing of the tug, effectiveness of tug operations, costs incurred including operations, an evaluation of the strengths and limitations of the stationed tug, and drill exercises.

3.2.4 Alternative D: An Integrative Restoration Approach

Alternatives A, B and C, can be integrated in a way that increases their effectiveness if they are applied simultaneously. Furthermore, because each of these alternatives attempt to increase populations by affecting specific population parameters, they are not independent.

Individuals within populations are affected by both the biological and physical environment. As such, the recovery of a population following events such as oil spills depends on both physical and biological factors. Because these factors operate at varying temporal and spatial scales, their relative effects are often difficult to identify. Furthermore, human activities contribute to both the physical and biological environment of populations further complicating our ability to identify any single factor that regulates or affects, independent of other factors, the growth of a population. The most effective restoration of populations affected by oil spills may require an integrated approach. This integrated approach would use all available techniques that promise predictable and testable results. Thus, this alternative proposes to combine actions described under Alternatives A, B and C, and to implement an integrated approach to seabird and kelp restoration.

The environmental consequences of projects that may occur under this integrated approach include the environmental consequences predicted under Alternatives A, B and C. No significant impacts to threatened or endangered species are expected to result from the integrated approach. If actions under this alternative are determined to have an adverse effect on the quality of the human environment, the project would be redesigned, relocated, or possibly abandoned. This alternative could indirectly benefit a variety of federally threatened and endangered species and state listed sensitive species by providing nesting, feeding, resting, rearing and other forms of habitats used during the lives of these species.