

FEB 7 1991

1

Final Draft

2/7/91 (Alaska's comments after WPG review; WPG rejoins; Cole comments)

Environmental Protection Agency  
[WH-FRL- ]

Agency: Environmental Protection Agency and the Alaska Department of Law

Action: Notice

Summary: The Environmental Protection Agency, acting to coordinate restoration on behalf of the Federal Trustees (the U.S. Departments of Interior and Agriculture and the National Oceanic and Atmospheric Administration), and the Alaska Department of Law, as the lead State Trustee, are publishing here 1) a discussion of the overall process the State and Federal governments intend to follow to enhance and expedite the recovery of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska from the Exxon Valdez oil spill and 2) a draft 1991 Restoration Work Plan comprised of restoration planning and implementation activities being considered by the Trustees. The public is invited to comment and to suggest other activities that should be considered by the Trustees in preparing this draft 1991 Restoration Work Plan. Notice of intent to take this action was published in the FEDERAL REGISTER in November (55 FR 48160, November 19, 1990).

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Dates: The Federal and State of Alaska governments will accept comments through [insert date 45 days from publication in the FEDERAL REGISTER]. Written comments should be submitted to: Secretary, Restoration Planning Work Group, Oil Spill Restoration Planning Office, 437 "E" Street, Suite 301, Anchorage, Alaska 99501, Phone (907) 271-2461.

I. Introduction

Purpose

The U.S. Departments of Agriculture (DOA) and the Interior (DOI), the National Oceanic & Atmospheric Administration (NOAA), and the Alaska Attorney General (hereafter referred to as "the Trustees") and the Environmental Protection Agency (EPA) desire to implement restoration activities in the areas affected by the Exxon Valdez oil spill as soon as practicable. This Notice contains a draft 1991 Restoration Work Plan comprised of restoration planning and initial implementation activities under consideration by the Trustee Council, an Alaska-based

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intergovernmental group charged by the Trustees with managing the natural resources damage assessment and restoration program for 1991. Restoration activities in 1991 and subsequent years will be undertaken as appropriate, based on the Trustees' increasing understanding of resource injuries and other relevant considerations. Implementation activities in 1991 will not foreclose future restoration options and are not intended to be a complete or comprehensive restoration program. Implementation of all restoration activities will follow appropriate procedures for compliance with applicable State and Federal laws and regulations. The President of the United States has designated EPA to coordinate, on behalf of the Federal Trustees, the long-term restoration of Prince William Sound and other areas affected by the Exxon Valdez oil spill. Accordingly, the EPA Administrator is issuing this document as an action under the Clean Water Act together with the Alaska Attorney General.

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Although preparation of the draft 1991 Restoration Work Plan is not required under the Clean Water Act or the laws of Alaska, the Trustees and EPA have chosen to present this document to obtain public comment and to invite suggestions about other restoration activities that should be considered by the State and Federal governments. The public is also invited to comment on the overall process the governments intend to follow in enhancing environmental recovery in Prince William Sound, lower Cook Inlet, and the Gulf of Alaska and achieving restoration of affected resources and services after the Exxon Valdez oil spill.

COLP  
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 Had to check again if OK, if not get Charles & Liza.

The Trustees expect to complete the assessment of damages, determine liability, and collect funds from the responsible parties before they prepare a final Restoration Plan. Although the Trustees wish to resolve damage assessment and liability issues as promptly as possible, it is not possible to predict when this will occur. Considering this uncertainty, in cases where the nature of the resource injury, loss or destruction [hereinafter referred to as "injury"] is reasonably clear, and where no alternatives would be foreclosed, it may be desirable to begin implementation of certain restoration activities prior to a final Restoration Plan. As a result, the Trustees are considering implementation in 1991 of activities described in Section III of this notice. Other activities related to restoration, such as feasibility studies, technical support projects, and monitoring (see Sections 2 and 3), will be considered in the following months and will be presented to the public for review and comment. The Trustees also expect to publish a revised 1991 Restoration Work Plan in the FEDERAL REGISTER in the Spring. Trustees also expect subsequently to publish notice of and to solicit public comment on detailed descriptions for each of the restoration projects selected for implementation in 1991.

Explained to COLP, need to talk back w him.

Organization of this Notice

This notice has three main sections: I. Introduction, II. Restoration Planning, and III. draft 1991 Restoration Work Plan. The Introduction presents a synopsis of the purpose of this

FEB 7 1991

3

notice and background information. Section II, Restoration Planning, describes the overall approach to restoration and reports on the planning activities conducted in 1990. In Section III, this notice provides information on restoration planning and initial implementation actions under consideration for 1991.

#### Further Information

Further information about the Exxon Valdez oil spill, the damage assessment studies, and restoration planning activities is contained in the documents referenced at the end of this notice and in the FEDERAL REGISTER published on November 19, 1990 (55 FR 48160). These documents and other information on restoration and damage assessment are available from the Oil Spill Public Information Center, 645 G Street, Anchorage, Alaska 99501.

## II. Restoration Planning

### A. The Planning Process

The Trustees' and EPA's restoration planning activities are designed to determine appropriate ways to restore natural resources and services injured by the Exxon Valdez oil spill. Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the environment to its baseline condition.

The Natural Resource Damage Assessment (NRDA) regulations [43 CFR 11], which implement certain provisions of CERCLA and CWA, define "restoration" or "rehabilitation" as "...actions undertaken [in addition to response actions], to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided...". This definition of restoration from the NRDA regulations is provided here for informational purposes. The NRDA regulations are not mandatory but do provide a model for restoration planning.

The Trustees have determined that restoration after the Exxon Valdez oil spill should be subject to continuing review as information is developed about injuries and possible restoration opportunities. The Trustees expect that each year's work will build on the last, and that all information pertinent to the Exxon Valdez oil spill will be examined in the course of the restoration process.

#### 1. Steps in the Planning Process

The restoration planning process is a dynamic and evolving process that will generally include the following steps:

##### a. Determining the Need for Restoration.

The need for restoration depends on the nature and extent of natural resources injured, lost, or

FEB 7 1991

4

destroyed and the adequacy of natural recovery. The primary information sources regarding resource injury, loss, or destruction are the studies conducted by State and Federal agencies as part of the natural resources damage assessment. These studies are described in the 1989 and 1990 Exxon

conducted by government agencies outside of the damage assessment process.

b. Identifying Potential Restoration<sup>II</sup> Activities

For any injury, there are three possible types of restoration which may be used singularly or in any combination:

direct restoration refers to measures in addition to response actions, usually taken on site, to directly restore or rehabilitate an injured, lost, or destroyed resource or otherwise to promote or enhance the recovery of such resources;  
replacement refers to substituting one resource for an injured, lost, or destroyed resource of the same or similar type; and  
acquisition of equivalent resources means to compensate for an injured, lost, or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource.

Determining the adequacy of natural recovery is fundamental to the choice of a restoration activity. In some cases the Trustees may determine that it is most appropriate to allow natural recovery to proceed without further intervention by man (i.e., no action alternative). The definition of direct restoration includes any administrative actions that may be taken by the Federal or State agencies, such as limiting certain activities in the affected areas, to promote recovery of injured resources.

c. Evaluating Potential Restoration Alternatives.

Evaluation of potential restoration alternatives will consider such factors as:

- nature and extent of injury;
- adequacy of natural recovery;
- technical feasibility;
- net environmental benefit (including indirect impacts);



FEB 7 1991

5

- cost effectiveness;
- reasonableness of cost of the restoration project in light of the value or ecological significance of the resource; and
- results of actual or planned response actions.

Some restoration proposals may be readily evaluated. In other cases additional information, for example, biological, ecological, or resource assessment data, will be gathered to support the evaluation process.

The goal of the Trustees and EPA is to conduct restoration planning for the recovery of ecosystems. In general, priority will be given to alternatives which benefit multiple rather than single species or resources. By necessity, however, individual elements of the restoration program may be species- or resource-specific.

d. Recommending and Implementing Restoration Activities on a Continuing Basis.

As information about injuries, resources recovery, restoration methods or costs becomes available, certain activities may be recommended and carried out in advance of the receipt of funds for restoration from the parties responsible for the oil spill (see Section III, below).

Deleted content about "dynamic process" per Wilkins, Smiley & Cole

e. Presenting a Damage Claim to Parties Responsible for the Oil Spill and Receiving Funds for Restoration.

The damage assessment process initiated by the Trustees is designed to identify and quantify specific resource injuries and determine restoration costs and other corresponding monetary values. The Federal and State governments will present their claims for these amounts to the parties responsible for the oil spill as required by Federal and State law.

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f. Preparing and Implementing a Final Restoration Plan.

When the full amount of restoration funds that will be recovered has been resolved, final determinations will be made concerning the nature and scope of the remaining phases of restoration.

g. Evaluating the Effectiveness of Restoration Measures, and Recommending Additional Actions. Implementation of restoration activities and the success of resource recovery will be monitored and evaluated based on standards appropriate to individual projects and

FEB 7 1991

6

met. Long-term monitoring activities also may be implemented to verify that the affected area is recovering as anticipated. DOJ

Restoration planning, as outlined above, is underway; the overall pace of restoration is dependent on the availability of information to determine injury and the resolution of a claim for damages. Implementation of restoration and monitoring activities may take a number of years. The Trustees and EPA intend to follow the restoration planning process as outlined above in order to accelerate the restoration of the Prince William Sound-Gulf of Alaska ecosystem and the affected natural resources and services.

## 2. Public Participation

The Trustees and EPA intend to encourage, provide for, and be responsive to public participation and review during the restoration planning process. Carrying out this intent, however, is complicated by the need for confidentiality with respect to damage assessment information due to pending or possible future litigation with the parties responsible for the Exxon Valdez oil spill. Notwithstanding these considerations, the Trustees intend to provide an opportunity for meaningful public review and comment on all restoration implementation activities.

In September of 1990, the Oil Spill Public Information Center was opened in Anchorage to provide the public with scientific data and other information related to the 1989 Exxon Valdez oil spill. The Trustees will continue to place information in the center as it becomes available.

## 3. Restoration Planning Activities in 1990

The Trustees and EPA began to solicit public opinion in March 1990 with a symposium on restoration in Anchorage, Alaska. In April and May of 1990, eight public scoping meetings were held throughout southcentral Alaska to ascertain the public's priorities for the restoration program. For a detailed description of these meetings, see the documents referenced at the end of this notice. In addition to these public meetings, the governments have communicated individually with such constituencies as Native corporations and villages, fishing groups, and environmental organizations.

To gather specific scientific input for the restoration planning process, technical workshops were held in Anchorage in April 1990. Follow-up meetings were held in October and November 1990. Participants included members of the Restoration Planning Work Group (the Alaska Departments of Fish and Game, Environmental Conservation, and Natural Resources, and the U.S. Departments of Interior and

FEB 7 1991

7

Agriculture, the National Oceanic and Atmospheric Administration, and the U.S. Environmental Protection Agency) Federal and State resource managers, and scientists and technical experts under contract to the governments. Due to the necessary discussion of litigation-sensitive damage assessment information, these workshops were closed to the general public.

The Restoration Planning Work Group completed a preliminary literature search, which identified articles and other published material concerning techniques for ecological restoration following oil spills. Approximately 200 publications were acquired for detailed review and are listed in the August 1990 Progress Report.

The Trustees and EPA initiated several small-scale field studies to evaluate the feasibility of restoration techniques. Results from these studies will help determine the costs and effectiveness of full-scale restoration projects. Several technical support studies were also initiated to provide information needed to evaluate or carry out some potential restoration activities. These studies are described in the "State/Federal Natural Resources Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill," August 1990. The 1990 studies and preliminary results are summarized below.

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1990 Restoration Feasibility Studies

1. Reestablishment of Fucus in Rocky Intertidal Ecosystems  
Lead Agency: U.S. Environmental Protection Agency

Early observations indicated that Fucus, a marine plant (rockweed) found on rocky shorelines in the intertidal zone throughout the oil spill area, was extensively damaged by both the spilled oil and cleanup efforts. If the natural recovery of Fucus could be significantly accelerated or enhanced it would benefit the recovery of associated flora and fauna on intertidal rocky shores.

Specific objectives of this study were to identify the causes of variation in Fucus recovery at and near Herring Bay, Knight Island in Prince William Sound; to document the effects of alternative cleaning methods on Fucus; and to test the feasibility of enhancing the reestablishment of Fucus. Although results are preliminary at this time, it appears that Fucus recovers most slowly at the sites that were intensively cleaned and that almost no recovery occurs where tar cover persists.

2. Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems  
Lead Agency: U.S. Forest Service

This feasibility study was designed to compare the rates



FEB 7 1991

8

of faunal recovery in rocky intertidal communities, and to demonstrate the feasibility of restoration of these communities by enhancing recolonization rates for such key species as limpets and starfish. Recolonization rates for these organisms and for the rockweed, Fucus, may limit the natural rates of recovery for the entire community. Parameters examined included the presence or absence of common intertidal species on impacted and reference sites, population dynamics of several species of invertebrates, larval settlement on oiled versus non-oiled surfaces, and differences in algal grazing by limpets between oiled and referenced sites. Preliminary results indicate that heavy predation of several species of transplanted invertebrates was probably due to the lack of cover usually provided by Fucus.

3. Identification of Potential Sites for Stabilization and Restoration with Beach Wildrye  
Lead Agency: Alaska Department of Natural Resources

This study was designed to identify sites at which damage to beach wildrye grass has occurred and to recommend restoration measures. This species was affected by both spilled oil and subsequent cleanup activities. Beach wildrye grass is important in the prevention of erosion in the coastal environment and is a key component of supratidal habitats in locations throughout the oil spill area. Erosion resulting from loss of beach wildrye can lead to the destabilization and degradation of wildlife habitats and of cultural and recreational sites. Survey work in 1990 in Prince William Sound indicated injury to several beach rye communities. Following confirmation in the 1991 spring shoreline assessment, restoration activities can be initiated (see Restoration Project 1 summary).

4. Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill  
Lead Agencies: U.S. Fish and Wildlife Service,  
Alaska Department of Fish and Game.

A diversity of birds, mammals, and other animals were killed by the spill or injured by contamination of prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for activities such as feeding and resting, but many also use upland habitats. Protection of upland habitats from further degradation may reduce cumulative effects on injured fish and wildlife populations, and thereby help them recover from the effects of the oil spill. This study focused specifically on marbled murrelets and harlequin ducks, two species known to have been affected by the spill and known to use upland habitats.

Based on surveys of 140 streams, preliminary results



FEB 7 1991

9

of the harlequin duck study indicate that this species nests along larger-than-average anadromous fish streams, with moderate gradients and clear waters. Preliminary results on murrelets suggest that murrelets use slopes facing north or west, and inland areas at the heads of bays as opposed to the outer peninsulas. Open bog meadows, especially at the heads of bays, appear to be used as flight corridors to upper wooded areas.

5. Land Status, Uses, and Management Plans in Relation to Natural Resources and Services  
Lead Agency: Alaska Department of Natural Resources

The objective of this study is to locate, categorize, evaluate, and determine the availability of maps, management plans, and other resource documents relevant to restoration planning throughout the oil-spill region. Resource materials identified will assist in planning for and implementing site-specific restoration activities, including direct restoration, replacement, and the acquisition of equivalent resources.

To date, a variety of documents, maps, and management plans have been identified and are being evaluated; other resource materials are being located. This preliminary project will be completed in Spring 1991. A second phase, directly supporting the proposed Restoration Project Number 4, Protection of Strategic Fish and Wildlife Habitats and Recreation Sites, is under consideration.

#### C. 1990 Technical Support Projects

1. Peer Reviewer Process for Restoration Feasibility Studies  
Lead Agencies: Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency

This project provided funds to ensure that scientists with expertise on natural resource restoration were available to provide peer review of restoration feasibility projects and other restoration planning studies and activities.

2. Assessment of Beach Segment Survey Data  
Lead Agency: Alaska Department of Natural Resources

The objective of this project is to review and summarize beach survey information (obtained through oil spill response activities) to assist in planning for and implementing site-specific restoration activities, particularly in the area of direct restoration. This study was initiated late in



FEB 7 1991

10

1990 and continues to date.

A master database is being created from that portion of the beach surveys relevant to restoration. The primary sources of this information are the Alaska Departments of Natural Resources and Environmental Conservation. Data from local and regional governments as well as non-governmental sources will also be reviewed and integrated into the system as appropriate. This preliminary project will be completed in Spring 1991.

3. Development of Potential Feasibility Studies for 1991  
Lead Agencies: Alaska Department of Fish and Game,  
U.S. Environmental Protection Agency

This project provided for the orderly development of additional feasibility studies including: a) monitoring "natural" recoveries; b) pink salmon stock identification; c) herring stock identification/spawning site inventory; d) artificial reefs for fish and shellfish; e) alternative recreation sites and facilities; f) historic sites and artifacts; and g) availability of forage fish. Currently feasibility study proposals are under consideration for all of the above themes.

### III. 1991 Restoration Work Plan

The Trustees are currently developing and evaluating restoration planning and implementation activities, which will be described in the 1991 Restoration Work Plan to be published in the FEDERAL REGISTER later in the Spring. Planning activities will include feasibility studies, technical support studies, and natural recovery monitoring which will be made available to the public for review and comment. Implementation activities that are now under consideration are presented in this section. The Trustees and EPA are asking, through this notice, for public comment on and additional suggestions for restoration planning and implementation activities for 1991. As noted previously, the Trustees and EPA anticipate publishing later this Spring a notice of the restoration projects identified for implementation in 1991. More detailed descriptions for 1991 restoration projects will be made available to the public for comment.

#### A. 1991 Restoration Planning Activities

The fundamental purpose of restoration planning is to identify and evaluate potential restoration implementation activities, in consultation with technical experts and the public. The integration of results from the damage

FEB 7 1991

11

assessment and other information into restoration planning is critical to the success of the oil spill program. As damage assessment results are reviewed and evaluated, the Trustees will identify potential restoration implementation activities and related feasibility and technical support projects. This process involves ongoing consultations with principal investigators for damage assessment studies, agency experts, and outside peer reviewers to review the nature and extent of oil spill injuries in relation to the biology and ecology of injured species, habitats, and ecosystems. A key goal is to identify life history requirements, limiting factors, and environmental processes that are especially sensitive or that may be enhanced.

Section II describes five feasibility studies carried out in 1990, some of which may continue in 1991. The Trustees and EPA are considering additional feasibility and technical support projects in 1991 and, following additional review, intend to discuss them in the Spring 1991 FEDERAL REGISTER Notice. Studies now being considered concern a variety of resources, including pink salmon, tidal marshes, Pacific herring, bald eagles, recreation, and sea otters. Feasibility and technical support studies will be implemented as damage assessment data and funding become available.

The scientific literature and experience from oil spills other than the Exxon Valdez will provide background on restoration and information from other oil spills. In 1991, the Restoration Planning Work Group expects to review and evaluate previously identified literature on restoration (see Appendix B, August 1990 Progress Report) and to continue review and evaluation of literature on species and ecosystem recoveries following anthropogenic and natural environmental disturbances.

Information on the adequacy of natural recovery is central to determining whether to implement restoration actions or to allow injured resources to recover on their own. Direct measures of recovery, such as species distribution, abundance, diversity, growth, reproductive success, or other physiological and biochemical properties, may be appropriate monitoring objectives. In some cases, it is appropriate to indirectly determine the degree of recovery by measuring exposure (presence of oil residuals and/or metabolites) and by applying knowledge of toxicological effects derived from the oil spill literature. For these reasons, the recovery of injured resources can best be followed by implementing a balanced program of monitoring. The duration of recovery monitoring will depend on the time necessary to establish a trend for recovery, and this in turn will necessarily depend on the severity and duration of effects resulting from the oil spill.

Some recovery monitoring studies will be considered for implementation in 1991. As with feasibility and technical support projects, these will be discussed in the March 1991

FEB 7 1991

12

FEDERAL REGISTER document.

Public participation will continue to be an important component of restoration planning in 1991. The Restoration Planning Work Group is interested in and will try to accommodate requests for meetings with individuals or groups. In addition, the Trustees will consider whether and what additional actions, such as publications and workshops, are appropriate and possible in 1991. Requests and suggestions from the public are invited.

#### B. 1991 Restoration Implementation Activities

Where the nature of the resource injury is reasonably clear, it may be desirable to begin restoration prior to receipt of funds from the parties responsible for the oil spill. There are several reasons why this may be so.

Failure to undertake timely restoration may allow damages initiated by the spill to continue or accelerate, as in the case of the loss of stabilizing vegetation on beaches. In other cases, protection of strategic habitats, subject to land-use changes, can reduce cumulative stresses on injured resources and maintain, in the near term, a full range of restoration options. Finally, the importance of a resource for subsistence, commercial, or recreational purposes may justify prompt restoration action.

The restoration activities being considered by the Trustees for implementation in 1991 are described below. Before making final decisions for the 1991 program, the Trustees are prepared to conduct public meetings in some of the oil spill communities, if requested to do so. Moreover, the Trustees expect to provide further opportunity for public comment on the 1991 restoration projects after detailed descriptions for each project are available. The projects now under consideration for the initial phase of the restoration process are:

1. Restoration of the Beach Wildrye Community  
Lead Agencies: Alaska Department of Environmental Conservation, U.S. Forest Service

##### Need and Objectives

The high intertidal-supratidal beach wildrye grasses (Elymus arenarius and E. mollis) communities show signs of localized injury as a result of the Exxon Valdez oil spill and the associated cleanup activities. Injury appears to have resulted from oiling and the stress of mechanical abrasion resulting from oil removal operations carried out by cleanup workers and equipment. Beach wildrye grasses are major contributors to natural beach stability. Injury to this important plant community may result in accelerated erosion of the beaches and adjacent upland plant communities. Also at risk from increased



FEB 7 1991

13

erosion are several nearshore archaeological sites.

Once the beach wildrye root masses are disturbed, natural recovery may be slow, taking several years. Wildrye recolonizes primarily by spreading outward from undamaged plants, and this process can be stopped altogether if the rate of erosion is too great. This may result in a significant loss of intertidal and supratidal area. Restoration intervention may often restabilize a beach in one growing season.

The objective of this project is to stabilize injured sites where natural or cultural resources are at risk. Specific sites for restoration will be chosen following the 1991 Spring Shoreline Assessment. The Department of Environmental Conservation and the Forest Service are also exploring whether this project may more appropriately be carried out under the State/Federal response program.

#### Methods:

Replanting beach wildrye for stabilization is a proven technology. Nearby healthy stocks of beach wildrye grass will be used as a source of donor material. After replanting, fertilizer will be applied (20-20-10 fertilizer up to 800 pounds per acre) to help the transplanted beach wildrye grass recolonize. At some locations fertilizer alone may be sufficient to encourage existing injured plant communities to recover without transplanting new stock.

Estimated 1991 Cost: \$180,000

2. Public Information and Education for Recovery and Protection of Alaska's Marine and Coastal Resources  
Lead Agencies: U.S. Fish and Wildlife Service,  
National Park Service

#### Need and Objectives:

The Exxon Valdez oil spill caused direct and indirect injury to the marine birds and mammals of southcentral Alaska. The purpose of this project is to make users of the area aware of the changes to the ecosystem resulting from the oil spill and to lessen the potential for additional harmful human disturbances..

#### Methods:

The project's sponsors will publish and distribute information explaining the potential adverse impacts of human activities, and the importance of increased conservation and protection of marine birds and mammals in key habitats in the oil spill area. Print media such as posters, brochures, and possibly books and video tapes

FEB 7 1991

14

will be produced. Consideration will also be given to production of material for school curricula.

Print media will be distributed through traditional outlets including but not limited to refuge, park, and tourist information and visitor centers. Additional distribution will occur to airports, boat harbors, commercial tour operators, and to public agency and private industry training staffs.

Some species identification information will be included but the primary content of the media will emphasize strategies to allow public use and enjoyment of marine birds and mammals while preventing harmful disturbances to these species.

Estimated 1991 Cost: \$100,000.

3. Salmonid Stocks and Habitat Restoration  
Lead Agencies: Alaska Department of Fish and Game,  
U.S. Forest Service

**Need and Objectives:**

Spawning and nursery areas of wild stocks of pink and chum salmon which were impacted by the Exxon Valdez oil spill occur throughout Prince William Sound, lower Cook Inlet, and the Gulf of Alaska. Pink and chum salmon are major components of the ecosystem, serving as important food sources for other fish, birds, terrestrial and marine mammals. Pink and chum salmon are also harvested by man in subsistence, commercial, and sport fisheries. Since salmon return to the individual streams in which they were born, with little straying to other streams, genetically unique wild salmon stocks will be restored and enhanced through site specific rehabilitation of salmon spawning and rearing habitats.

**Methods:**

This project consists of several proven fisheries enhancement techniques that may be applied immediately at specific sites. In addition to those sites and streams at which potential rehabilitation activities already have been identified, a survey of affected salmon spawning habitat within the oil spill area will be conducted in 1991 to determine additional restoration measures. The proposed techniques include fish passage through stream channelization or fish ladders to overcome physical and hydrological barriers and construction of spawning channels. All of these measures provide oil-free spawning areas to replace oil-impacted spawning areas. Additional wild salmon stock restoration measures include remote egg-taking and incubation at existing hatcheries for ultimate fry release in oil-impacted streams. Other

FEB 7 1991

15

measures may include optimal fry release programs that will enhance marine survival of juvenile salmonids.

Estimated 1991 Cost: \$1,300,000

4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead Agencies: Alaska Department of Fish and Game,  
Alaska Department of Natural Resources  
U.S. Department of the Interior,  
U.S. Department of Agriculture

Need and Objectives:

The marine and intertidal habitats where most oil spill injuries occurred are ecologically linked to adjacent uplands. The water quality in streams and estuaries where salmon spawn depends on the adjacent uplands. Eagles nest and roost in large trees along the coasts and streams, and marbled murrelets nest in association with forested uplands. Harlequin ducks nest in riparian habitats and feed in the streams as well as in nearby intertidal and estuarine areas. Common and thick-billed murres and other seabirds nest on off-shore islands.

Tourism and recreation activities, such as sport fishing and camping, also depend on the quality and accessibility of shorelines and uplands. The diversity, productivity, and uses of intertidal and estuarine habitats, and of freshwater streams along the coast depend on the ecological integrity of the adjacent uplands. Continued productivity in the undamaged parts of the regional ecosystem, including strategic marine, intertidal, and estuarine habitats and adjacent uplands, may be necessary for the recovery of biological communities that were injured.

During the public scoping process the governments received many restoration suggestions that involved the protection of prime fish and wildlife habitats, recreation sites, and adjacent uplands. Suggested approaches to this protection included land acquisition and changes in management practices.

Land-use activities may occur in the oil spill area in 1991 or 1992. These activities may impact important habitats and recreation sites or slow the recovery of spill-injured resources.

The objective of this project is to identify and protect strategic wildlife and fisheries habitats and recreation sites and to prevent further potential environmental damages to resources injured by the Exxon Valdez oil spill. This project will be preceded by a technical support project to identify and evaluate

FEB 7 1991

potential properties which if publicly owned will contribute to this objective. Where acquisition of property rights is determined to be appropriate, they will be acquired on a willing buyer/willing seller basis. Primary considerations in deciding which properties should be acquired during this project will include 1) the nature and immediacy of changes in use that may further affect resources injured by the oil spill and 2) the prospect that failure to act will foreclose restoration opportunities.

The Trustees have developed the following preliminary sequence of steps for use in identifying and protecting strategic fish and wildlife habitats and recreation sites:

1. Identification of **key** upland habitats that are linked to the recovery of injured resources or services by injury data or other relevant information.
2. Characterization and evaluation of potential impacts from changed land use in relation to their effects on recovery of the ecosystem and its components; comparative evaluation of recovery strategies not involving acquisition of property rights, including an assessment of protections afforded by existing law, regulations, and other alternatives.
3. Evaluation of cost-effective strategies to achieve restoration objectives for key upland habitats, identified through steps one and two above. This would include evaluation of other restoration alternatives for these resource injuries.
4. Willing seller/buyer negotiations with private landowners for property rights.
5. Incorporation of acquired property rights into public management.

COMPROMISE LANGUAGE  
 ✓ to say ✓  
 Ak & USDA can live with it

Habitat and recreation site acquisition proposals that meet the appropriate evaluation factors for restoration (see Section 2) will be identified and assigned by priority for implementation in accordance with this preliminary five-step process and applicable State and Federal laws and regulations.

The geographic scope of the 1991 project will be the oil spill area. Subsequent to this initial effort, the Trustees will continue to survey potential acquisitions, including acquisitions outside the spill area.

Estimated Cost: To be determined

c. Funding for the 1991 Restoration Work Plan

FEB 7 1991

17

Although it is expected that the responsible parties will pay for the costs of the damage assessment and restoration program, there is no certainty about the final amount and when such funds will be forthcoming. It is possible, therefore, that funds to carry out the 1991 Restoration Work Plan, including the proposed planning and implementation activities, will have to be advanced by the State and Federal governments. To date, those funds have not been committed or secured by either government.

#### D. References

The documents listed below provide additional information on damage assessment and restoration. They are available from the Oil Spill Public Information Center, The Simpson Building, 645 G Street, Anchorage, Alaska, 99501.

"The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill, Volume I Assessment and Restoration Plan Appendices A,B,C."

"State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill," August 1989.

"Restoration Planning following the Exxon Valdez Oil Spill: August 1990 Progress Report."

"Restoration following the Exxon Valdez Oil Spill: Proceedings of the Public Symposium," July 1990.

FEB 7 1991

18

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Lajuana S. Wilcher  
Assistant Administrator  
Office of Water  
U.S. Environmental Protection Agency

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Date

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Charles E. Cole  
Attorney General  
State of Alaska  
Final Draft

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Date

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Availability of Study Plans; Exxon Valdez Oil Spill

Vol. 56, No. 147

56 FR 36150

Wednesday July 31, 1991

AGENCY: ENVIRONMENTAL PROTECTION AGENCY

DOC TYPE: Notices

NUMBER: WH-FRL-3979-6

DATES: Comments on this notice and requests for copies of the study and work plans for 1991 should be received no later than September 16, 1991.

CONTACT: Linda R. Comerc, Environmental Protection Agency, or Stanley E. Senner, Alaska Department of Fish and Game, at 907-271-2461.

ADDRESS: All requests for copies of the study and work plans must be submitted in writing to the following address: Restoration Planning Work Group, c/o Oil Spill Public Information Center, 645 G Street, Anchorage, AK 99501.

ACTION: Notice of availability of study plans for 1991 restoration science studies and work plans for restoration implementation projects for the Exxon Valdez oil spill.

SUMMARY: This notice announces the availability of study plans for restoration science studies and work plans for restoration implementation projects that are in progress or may be carried out in 1991 and invites public comment. This notice is a follow-up to a prior notice, which announced the draft 1991 Restoration Work Plan (56 FR 8898, March 1, 1991).

WORD COUNT: 2,449

TEXT:

SUPPLEMENTARY INFORMATION:

## I. Introduction

On March 1, 1991 the Environmental Protection Agency (EPA), on behalf of the Federal Trustees (National Oceanic and Atmospheric Administration, Department of Agriculture, Department of the Interior), and the Alaska State Trustees (Department of Law, Department of Environmental Conservation, Department of Fish and Game) published in the Federal Register a draft 1991 Restoration Work Plan (56 FR 8898). It described restoration planning and implementation activities being considered by the Trustees for 1991. More details of these activities were to be described subsequently. Today's notice announces the availability of details about specific restoration activities in 1991 and provides additional opportunity for public comment.

The first part of this notice describes restoration science studies in 1991 and announces the availability of detailed study plans for these studies. The second part of this notice lists the titles of restoration implementation projects described in the March 1, 1991, Federal Register notice and announces the availability of detailed work plans for two of these projects. Many of the 1991 restoration science studies are being



funded either by the State or the Federal government. Efforts are underway to authorize funds for the remaining science studies.

Some Trustee agencies have funds for implementation of restoration projects. Not all Trustee agencies, however, have been able to locate funding for the restoration implementation projects and funds may not be available for these projects in 1991. The Trustees agencies intend to seek costs for restoration projects from responsible parties.

## II. Restoration Science Studies

### Background

Restoration science studies provide information used to evaluate potential restoration implementation activities. There are three types of studies (individual studies may serve more than one purpose):

- Feasibility studies test the practicality and potential success of proposed restoration techniques;
- Technical support studies provide biological information or other information necessary to identify, evaluate, or conduct restoration activities;
- Monitoring studies document the extent, degree, and pace of natural recovery of an injured resource.

Each of the 12 studies described below and in the detailed study plans has been reviewed by agency staff and outside experts. The Trustee Council also has evaluated each study, taking into account the following factors:

- a. Documentation of probable injury;
- b. Estimated time needed for natural recovery;
- c. Restoration activity or endpoint that may result from this study;
- d. Need for the proposed study with respect to the ability to carry out future restoration activities;
- e. Technical feasibility of the proposed study and the prospect for success;
- f. Importance of conducting the study in 1991 (i.e., would delay beyond 1991 result in a lost opportunity); and
- g. The cost of a proposed study relative to the degree of injury or to the cost of the potential restoration outcome.

The timing of this notice is such that all of the studies described below are now underway, with the exception of study number 11, "Pre-Spill and Post-Spill Concentrations of Hydrocarbons in Sediments and Mussels at Intertidal Sites in Prince William Sound". The Trustee Council however invites public review of the plans for all 12 studies. Any comments submitted by September 16, 1991 will be considered as the Trustee Council reviews the progress of these studies in 1991 and develops proposals for 1992. The detailed study plans for any or all of the studies may be obtained by written request to the address above.



Brief descriptions of each of the science studies follow:

1. Habitat Use, Behavior, and Monitoring of Harbor Seals in Prince William Sound

Lead agency: Alaska Department of Fish and Game.

This technical support and feasibility study will delineate habitats used by harbor seals and provide missing life history information. Satellite tagging methods will be tested. This study will identify possible opportunities for habitat protection and other {pg 36151} management activities. Cost: \$182,000.

2. Killer Whale Monitoring and Habitat

Lead agency: National Oceanic and Atmospheric Administration.

This technical support and monitoring study is designed to identify habitat needs and determine population trends for killer whales and other cetaceans in the spill area. In 1991 this study will analyze existing census and location data (1984 to present) to determine their adequacy in supporting decisions on habitat protection and other management activities. This study also will begin development of satellite tagging methods for year-round tracking of killer whales, although no tags will be applied in 1991. Cost: \$44,000.

3. Population Assessment of the Prince William Sound Sea Otter Population

Lead agency: U.S. Fish and Wildlife Service.

This feasibility and technical support study will develop a technique for sea otter population census and will gather data on otter habitat use. Development of an efficient and reliable census technique is necessary for tracking the long-term recovery of this injured species. The habitat data will be used to identify opportunities for habitat protection and other management activities. Cost: \$150,000.

4. Identification of Upland Habitats Used by Marbled Murrelets in Prince William Sound

Lead agency: U.S. Fish and Wildlife Service, U.S. Forest Service.

This technical support study will further document the presence or absence of marbled murrelets in selected upland habitats and characterize their nest habitats through vegetation mapping. This study may link an injured marine species with adjacent upland habitats and identify possible opportunities for habitat management and protection. Cost: \$124,000.

5. Prince William Sound Harlequin Duck Breeding Habitat Analysis

Lead agencies: U.S. Fish and Wildlife Service, U.S. Forest Service, Alaska Department of Fish and Game.

This technical support study will attempt to locate nests of harlequin ducks and characterize their nest sites in relation to streams, vegetation, and other habitat features. This study may link the injured marine bird

species with upland riparian habitats and identify possible opportunities for habitat management protection. Cost: \$223,000.

6. Feeding Ecology and Reproductive Success of Black Oystercatchers in Prince William Sound

Lead agencies: U.S. Fish and Wildlife Service

This technical support and monitoring study will track the breeding productivity and analyze the feeding ecology of a shorebird species at Herring Bay. It will provide data on the status and recovery of an intertidal predator in relation to the recovery of key intertidal invertebrates. Cost: \$60,000.

7. Dolly Varden and Cutthroat Trout Populations in Prince William Sound

Lead agency: Alaska Department of Fish and Game.

This technical support study will identify unoiled streams with Dolly Varden and cutthroat trout and estimate stock sizes. This will enable fisheries managers to redirect sport fishing from oiled to unoiled streams, where the stocks can better sustain harvest, allowing faster recovery of stocks in oiled streams. Cost: \$147,000.

8. Salmon Coded-Wire Tagging in Prince William Sound

Lead agency: Alaska Department of Fish and Game.

In this technical support study coded-wire tags will be applied to juvenile wild salmon, which will be recovered as adults the following year, to enable greater separation of wild and hatchery stocks. Separation of wild and hatchery stocks, which are harvested together in an intercept fishery, will enable management actions focused on the restoration of stocks from oiled streams. Cost: \$805,000.

9. Prince William Sound Pink Salmon Escapement Enumeration

Lead agency: Alaska Department of Fish and Game.

This technical support study will use weir counts to provide data on salmon escapements to compare with and "calibrate" aerial survey aerial. Streams will be walked to obtain additional information on intertidal spawners and stream enhancement opportunities. This study will provide information needed to determine management and enhancement alternatives to restore stocks from oiled streams. Cost: \$230,000.

10. Monitoring Coastal Habitats at Herring Bay

Lead agency: U.S. Forest Service.

This monitoring study will track recovery of intertidal invertebrates and marine plants in oiled, unoiled, and cleaned areas at Herring Bay, Prince William Sound. It will provide information needed to understand the extent, degree, and pace of the natural recovery of the intertidal ecosystem on which many species depend for food and habitat. Cost: \$245,000.

11. Pre-Spill and Post-Spill Concentrations of Hydrocarbons in Sediments and Mussels at Intertidal Sites in Prince William Sound

Lead agency: National Oceanic and Atmospheric Administration.

This study will monitor hydrocarbon levels in sediments and mussels at sampling sites for which there are historical data. Sampling supported by this study (a second late-summer sampling) will supplement early- spring sampling supported by the 1991 Natural Resource Damage Assessment Study, Coastal Habitat Intertidal Study 1B. A description of this study may be found in, "The 1991 State/Federal Natural Resource Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill" p.181-187, available from the Oil Spill Public Information Center whose address is given above. This study will provide a more complete history of exposure from releases of oil buried in intertidal sediments, particularly during biologically active summer months. The proposed second sampling will be conducted only if 1989 and 1990 sampling results indicate that seasonal factors affect levels of residual hydrocarbons in sediments and mussels. Cost: \$84,000.

12. Survey of Injured Tidal Marshes in Prince William Sound and the Gulf of Alaska

Lead agency: U.S. Environmental Protection Agency.

This technical support study will review existing data on the extent, relative value of, and injury to marsh-wetland habitats. The review may be supplemented by field surveys. Pending the results of this study, there may be field studies to test the feasibility of using hydrological and transplanting techniques to restore oiled marshes. Cost: \$15,000.

III. Restoration Implementation Projects

Four restoration implementation projects were described in the March 1, 1991 Federal Register notice (56 FR 8898). Work plans are now available for two of the four projects listed below, projects 2 and 3. Based on the results of the May Shoreline Assessment Program for Prince William Sound and the Gulf of Alaska, conducted by the U.S. Coast Guard, the State of Alaska and Exxon, the Trustees have decided that the need for the first project, "Restoration of the Beach Wild Rye Community, is limited. If any areas of Beach Rye are determined to need replanting, these activities will be carried out under the clean-up/response program.

The Restoration Planning Work Group is currently developing a process by which the fourth project, "Protection of Strategic Fish and Wildlife Habitats and Recreation Sites," could be implemented.

The proposed implementation projects are:

1. Restoration of the Beach Wild Rye Community

Lead agencies: Alaska Department of Environmental Conservation, U.S. Forest Service.

2. Public Information and Education for Recovery and Protection of Alaska's Marine and Coastal Resources

Lead agency: U.S. Department of the Interior.

3. Salmonid Stocks and Habitat Restoration

Lead agencies: Alaska Department of Fish and Game, U.S. Forest Service.

4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead agencies: Alaska Department of Fish and Game, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Forest Service, U.S. Environmental Protection Agency.

Public comments are invited on all four implementation projects.

Dated: June 19, 1991.

LaJuana S. Wilcher,

Assistant Administrator, Office of Water, U.S. Environmental Protection Agency.

Dated: July 18, 1991.

Charles E. Cole

Attorney General, State of Alaska.

INTERNAL DATA: FR Doc. 91-18107; Filed 7-30-91; 8:45 am; BILLING CODE 6560-50-M

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**RPWG PRODUCT FOR MANAGEMENT TEAM REVIEW  
DRAFT FR NOTICE OUTLINE  
NOVEMBER 13, 1990**

FEDERAL REGISTER NOTICE -- Draft Outline

Draft Restoration Work Plan and Proposed  
1991 Restoration Program

- I. Introduction (5 pages) **EPA**  
Purpose of this notice (Present draft restoration work plan and 1991 restoration program and report on results of 1990 projects)
- II. Restoration Plan Development (7 pages) **EPA/USDA**  
Introduction  
- Dynamic process, interim step only, information still being assessed  
- Leads to final restoration plan after settlement of damage claim  
Identification of need for restoration  
- NRDA data, feasibility studies, literature review, shoreline surveys etc.  
Development of alternatives  
- Public workshops, reports, literature review  
Evaluation of potential restoration measures  
- Feasibility studies, literature reviews, matrices, selection "criteria" etc.  
- Peer review and public comment  
Compliance with Federal/State statutes and regulations, i.e.. CZM, NEPA, and others  
Final restoration plan developed after settlement
- III. Summary of 1990 Restoration Work (5 pages) **EPA w. PIs**  
Restoration Planning Activities 1990 Feasibility Study Results
- IV. Proposed 1991 Restoration Program (7 pages + 2/proposed project) **AGENCY REPRESENTATIVES**  
Introduction  
Present 1991 restoration, feasibility, technical support, and recovery monitoring projects for comment, including "criteria" used for selection  
Peer Review  
Public comment/involvement/participation
- V. Summary and Request for public comment on items in this FR notice (2 pages) **EPA**

RESTORATION PLANNING PROCESS  
TALKING POINTS FOR LAJUANA WILCHER  
NOVEMBER 15, 1990

The disastrous grounding of the *Exxon Valdez* on March 24, 1989, set into action a large-scale, intergovernmental effort to contain the oil, clean the oil-impacted coastline, assess damages and prepare criminal and civil cases against the responsible parties, and last, but equally important, plan for and implement a restoration program. As we have all recognized, it is now time to focus our efforts on enhancing natural recovery and protecting critical habitats. We already know enough to carry out some restoration work and we recognize that restoration planning and implementation must be a dynamic process, incorporating new information as it becomes available. Flexible, responsive restoration planning does not eliminate on-going damage assessment, but builds on it. Some studies, for example the analysis of impact to certain species of salmon, will take years to complete so appropriate restorative actions cannot be planned now. On the other hand, sufficient data already does exist to begin restoration work for several resources.

The Draft Restoration Work Plan to be published in the Federal Register this December will stimulate public interest in restoration following the *Exxon Valdez* oil spill and illustrate <sup>at</sup> the complicated process to restore the environment is proceeding in a timely fashion. Following public review and comment, the revised Restoration Work Plan will be published in the Federal Register on March 24, 1991. After damage claims have been settled and, consequently, funds are available, a final restoration plan will be drafted, reviewed by the public, revised, and implemented.

Of course, all of this work requires your continued dedication and careful attention. Just to bring you all up to date, here is a summary of recent actions:

- The Federal Register notice of intent to publish a Draft Restoration Work Plan and Proposed 1991 Restoration Program has been signed by myself, for the federal trustees, and Gregg Erickson, for the State of Alaska. The expected publication date is Monday, November 19. ~~I have copies of the notice of intent for those of you who have not yet received one.~~
- The Restoration Planning Work Group is now writing the draft work plan and proposed 1991 program, scheduled to be published in the Federal Register in late December.

The work group has completed an outline of this second Federal Register notice and has made assignments for writing the first draft, which is due to the management team on November 30.

Between October 30th and November 2nd, the work group, legal team, and Bob Spies met with the principal investigators for damage assessment and

restoration studies to make preliminary decisions on projects that could be proposed for the 1991 season. Essentially the same group is meeting again tonight (11/15) to further refine the list. The proposed projects will be fully described in the Federal Register notice and public comment will be solicited.

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request.

{ (NOTE TO LAJAUANA: A preliminary list of potential 1991 projects is attached for your information. Susan MacMullin can provide you more information on other studies under consideration.) Please consider this list confidential until the NT/TC has had time to review it. }

The work group also briefed the management team and presented the proposed outline and the ~~list~~ of potential restoration projects to them for review this past Tuesday. *process for selecting*

- An important procedural issue has arisen--that is, how to assure review at all levels as the work on the work plan progresses. Understandably, the policy group does not wish to be in the position of reviewing this document only at the last minute and, just as understandably, the management team and work group wish to continue to discharge their responsibilities in this process.

The management team and work group have made a couple of suggestions that may help. First, each agency should be passing information between Alaska and Washington, that is, management team member to trustee council member to Washington policy group member. In addition, either Steve Pennoyer, as representative of the lead trustee agency, or Susan MacMullin, EPA's management team representative who is splitting her time between Anchorage and Washington, could update the policy group. This second ? arrangement would need the concurrence of the trustee council.

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MEMORANDUM

DECEMBER 21, 1990

FROM: ~~SS~~ Stan Senner and <sup>sem</sup> Susan MacMullin

TO: Management Team  
Legal Team  
Trustee Council

SUBJECT: Distribution of the December 21, 1991 Draft Federal Register Notice

Attached is the draft Federal Register notice on restoration. The project descriptions in Appendix B need further attention. Also, USDA did not have sufficient lead time to provide us with comments on the habitat protection project. We will address these changes after the Trustee Council teleconference at 9:00 a.m. on the 27th of December.

Please call either of us (Stan - 907/271-2461, Susan - 202/245-4373) if you have any questions.

Attachment

Distribution: Mike Barton  
Don Collinsworth  
Al Ewing  
Steve Pennoyer  
Walter Stieglitz  
Dave Gibbons  
Gregg Erickson  
Byron Morris  
Paul Gertler  
Cordell Roy  
Maria Lisowski  
Liza McCracken  
Martha Fox  
Craig O'Connor  
Jim Nicoll  
Bart Freedman

cc: RPWG members



Environmental Protection Agency  
[WHR-L- ]

Agency: Environmental Protection Agency and the Alaska  
Department of Fish and Game

Action: Notice

Summary: The Environmental Protection Agency (EPA), on behalf of the Federal Trustees (the Departments of Interior and Agriculture and the National Oceanic and Atmospheric Administration), and the Alaska Department of Fish and Game, on behalf of the State Trustee, are publishing 1) a draft 1991 Restoration Work Plan comprised of restoration implementation activities being considered by the Trustee Council, and 2) a discussion of the overall process the state and federal governments intend to follow to enhance and expedite the recovery of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska after the Exxon Valdez oil spill. The public is invited to comment and to suggest other activities that should be considered by the Trustee Council in preparing a 1991 Restoration Work Plan. Notice of intent to take this action was published in the FEDERAL REGISTER in November (55 FR 48160, November 19, 1990).

Dates: The Federal and State of Alaska governments will accept comments through [insert date 45 days from publication in the Federal Register]. Written comments should be submitted to: Secretary, Restoration Planning Work Group, Oil Spill Restoration Planning Office, 437 "E" Street, Suite 301, Anchorage, Alaska 99501, Phone (907) 271-2461.

**Section I-Introduction**

Purpose: The Departments of Interior (DOI), of Agriculture (DOA), National Oceanic & Atmospheric Administration (NOAA), and the State of Alaska (hereafter referred to as "the Trustees") and EPA desire to implement restoration activities in the areas affected by the Exxon Valdez oil spill as soon as possible. By publishing this notice, the Trustees and EPA are expressing their intent to field a restoration program in 1991. This program will be comprised of implementation activities, feasibility and technical support studies and monitoring. Implementation activities in 1991 will be modest relative to those that would be carried out in a comprehensive program. The combined information in this Federal Register Notice and a subsequent Notice planned for

March, 1991 will provide a full discussion of the 1991 program.

This Notice presents a draft 1991 Restoration Work Plan comprised of restoration implementation activities under consideration by the Trustee Council, an Alaska-based inter-governmental group charged by the Trustees with managing the natural resources damage assessment and restoration program.

Although preparation of a 1991 Restoration Work Plan is not required under the Comprehensive Environmental Response, Compensation, and Liability Act, the Clean Water Act, or the laws of Alaska, the Trustees and EPA have chosen to present the draft 1991 Restoration Work Plan to obtain public comment and to stimulate suggestions about other restoration activities that should be considered by the state and federal governments. The public is also invited to comment on the overall process the governments intend to follow in enhancing environmental recovery in Prince William Sound, lower Cook Inlet, and the Gulf of Alaska after the Exxon Valdez oil spill.

Background: The Trustees expect to complete the assessment of damages, determine liability, and collect funds from the responsible parties before they prepare a final Restoration Plan. Although the Trustees wish to resolve damage assessment and liability issues as promptly as possible, it is not possible to predict when this will occur. Considering this uncertainty, in cases where the nature of the resource injury is reasonably clear, it is desirable to implement restoration activities prior to a final Restoration Plan. As a result, the Trustee Council is considering implementation in 1991 of activities described in section III of this notice or other activities that may be identified later in the process. The Trustees expect to publish a revised 1991 Restoration Work Plan in the Federal Register on or about March 21, 1991.

Organization of this notice: This notice has three main sections: I. Introduction, II. Restoration Planning, and III. Restoration Implementation. The Introduction presents a synopsis of the purpose of this notice and background information. Section II, Restoration Planning, describes the overall approach to restoration, the planning activities for 1990, and planning activities under consideration for 1991. In Section III, this notice provides information on restoration implementation actions under consideration for 1991.

Further information: Further information about the Exxon Valdez oil spill, the damage assessment studies, and restoration planning activities is contained in the documents referenced at the end of this notice and in the FEDERAL REGISTER published on November 19, 1990 (55 FR 48160).

## Section II-Restoration Planning

The Planning Process: The Trustees' and EPA's restoration planning activities are designed to determine appropriate ways to restore natural resources and services injured by the Exxon Valdez oil spill. Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the environment to its baseline condition.

The Natural Resource Damage Assessment (NRDA) regulations define "restoration" or "rehabilitation" as..."actions undertaken, in addition to response actions, to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided...". This definition of restoration from the NRDA regulations is provided in this notice for informational purposes only; the NRDA regulations are not mandatory in this process.

The state and federal governments have determined that restoration after the Exxon Valdez oil spill should be subject to continuing review as information is developed about injury and possible restoration activities. The Trustees expect that each year's work will build on the last, and that all information pertinent to the Exxon Valdez oil spill will be examined.

Although the restoration planning process may be modified to accommodate new information, the governments contemplate the following steps:

Step 1. Determining the Need for Restoration. The need for restoration depends on the nature and extent of natural resources injuries, and the adequacy of natural recovery. The primary information source regarding injury, damage, or loss is the studies conducted by state and federal agencies as part of the natural resources damage assessment. These studies are described in the 1989 and 1990 Exxon Valdez damage assessment plans (see the documents referenced at the end of this notice). Other sources of information include public comments, data gathered as part of the oil spill response, and other studies conducted by government agencies outside of the damage assessment process.

Step 2. Identifying Potential Restoration Activities. For any injury, there are three types of possible restoration activities:

- A. direct restoration refers to measures in addition to response actions to directly rehabilitate an injured, lost, or damaged resource.
- B. replacement refers to substituting one resource for an injured, lost, or damaged resource of the same or similar type; and
- C. acquisition of equivalent resources means to compensate for an injury to a resource by substituting a

resource that provides the same or substantially similar service as the resource injured, lost, or damaged.

In addition, the no action alternative is used when natural recovery will not be enhanced by a restoration action.

A variety of potential restoration activities and concepts from numerous sources have been presented in a series of matrices in Restoration Planning Following the Exxon Valdez Oil Spill: August 1990 Progress Report.

Additional activities will be identified and considered at any time as additional damage assessment data are received.

Step 3. Evaluating Potential Restoration Activities.

Potential restoration activities and concepts will be evaluated according to the following factors:

- A. documentation of the injury;
- B. determination of the adequacy of natural recovery;
- C. establishment of technical feasibility;
- D. determination of net environmental benefit;
- E. determination of cost effectiveness; and
- F. establishment of the reasonableness of the cost of the restoration project in light of the value and importance of the resource.

Some restoration proposals may readily satisfy these evaluation requirements, but in other cases additional technical information--for example, biological, ecological, or resource assessment data--will be gathered as needed as part of the restoration planning process.

The Trustees and EPA will focus restoration planning on the recovery of ecosystems rather than on individual components. By necessity, however, individual elements of the restoration program may be species- or resource-specific. In general, priority will be given to activities which benefit multiple rather than single species or resources.

Step 4. Recommending and Implementing Restoration Activities on a Continuing Basis. The Trustees and EPA view the entire restoration process as dynamic and evolutionary. Consequently, as information on damages becomes available, certain restoration activities may be recommended and carried out in advance of the receipt of funds for restoration from the parties responsible for the oil spill (see Section III, below).

Step 5. Presenting a Damage Claim to Parties Responsible for the Oil Spill and Receiving Funds for Restoration. The damage assessment process initiated by the Trustees is designed to identify and quantify specific

resource injuries and determine the corresponding monetary values. Claims for these amounts will be presented to the parties responsible for the oil spill and, under federal law, the monies received must be used to plan for or implement restoration activities, after reimbursing the costs of the damage assessment program.

Step 6. Preparing and Implementing a Final Restoration Plan. When restoration funds are received, final determinations will be made concerning the nature and scope of all remaining restoration activities. Implementation of any restoration activity will follow appropriate procedures for compliance with relevant state and federal laws and regulations, including but not limited to the National Environmental Policy Act, the Alaska National Interest Lands Conservation Act, the Alaska Claims Settlement Act, and the Coastal Zone Management Act.

Step 7. Monitoring the Effectiveness of Restoration Measures, and Recommending Additional Actions. Restoration activities will be monitored and evaluated based on standards appropriate to individual projects and resources. In addition to verifying that restoration goals have been met, monitoring will be designed to identify lingering injuries and problems that can be addressed through modified or additional restoration actions.

Restoration planning, as outlined above, is underway; the overall pace of restoration is dependent on the availability of information to determine injury and the resolution of a claim for damages. Implementation of restoration and monitoring activities may take a number of years. The Trustees and EPA intend to follow the restoration planning process as outlined above in order to restore the Prince William Sound-Gulf of Alaska ecosystem in less time than if restoration is left entirely to natural processes.

Public Participation: The Trustees and EPA intend to encourage, provide for, and be responsive to public participation and review during the restoration planning process. However, carrying out this intent is complicated by the need for confidentiality with respect to damage assessment information due to pending or possible future litigation. Notwithstanding these considerations, the Trustees intend to provide opportunity for meaningful public review and comment on all restoration implementation activities.

Restoration Planning Activities in 1990: The Trustees and EPA began a variety of public activities in March, 1990 with a public symposium on restoration in Anchorage, Alaska. In April and May of 1990, eight public scoping meetings were held throughout southcentral Alaska to gain a sense of the public's priorities for the restoration program. (For a detailed description of these meetings, see the documents

referenced at the end of this notice.) In addition to these public meetings, the governments have communicated individually with such constituencies as Native corporations and villages, fishing groups, and environmental organizations.

To gather specific scientific input for the restoration planning process, technical workshops were held in Anchorage in April, 1990. Follow-up meetings were held in October and November, 1990. Participants included members of the Restoration Planning Work Group, federal and state resource managers and scientists and technical experts under contract to the governments. Due to the necessary discussion of litigation-sensitive damage assessment information, these workshops were closed to the general public.

The Restoration Planning Work Group completed a preliminary literature search, which identified articles and other published material concerning techniques for ecological restoration following oil spills. Approximately 200 publications were acquired for detailed review and are listed in the August, 1990 Progress Report.

The Trustee agencies and EPA initiated several small-scale field studies to evaluate the feasibility of restoration techniques. Results from these studies will help to determine the costs and effectiveness of full-scale restoration projects. Several technical support studies were also initiated to provide information needed to evaluate or carry out some potential restoration activities. These studies are described in the 1990 State/Federal Natural Resources Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill, August 1990. The 1990 studies and preliminary results are summarized in Appendix A.

### **Section III-Draft 1991 Restoration Work Plan**

1991 Restoration Planning Activities: Consistent with the seven steps outlined in Section II, several restoration planning activities will continue in 1991. The fundamental purpose of restoration planning is to identify and evaluate potential restoration implementation activities, in consultation with technical experts and the public.

The integration of results from the damage assessment into restoration planning is critical to the success of the oil-spill program. As damage assessment results are synthesized, the Restoration Planning Work Group will identify potential restoration implementation activities and related feasibility and technical support projects. This process involves on-going consultations with principal investigators for damage assessment studies, agency experts, and outside peer reviewers to review the nature and extent of oil-spill injuries in relation to the biology and ecology of injured species, habitats, and ecosystems. A key goal is to identify life-history requirements, limiting factors, and

environmental processes that are especially sensitive or that may be enhanced.

As described in Section II and Appendix A, five feasibility studies were carried out in 1990; some of them may continue in 1991. The Trustees and EPA are considering additional feasibility and technical support projects in 1991 and, following additional review, intend to discuss them in the March 1991 Federal Register Notice. Studies now being considered concern a variety of resources, including pink salmon, tidal marshes, Pacific herring, bald eagles, recreation, and sea otters, among others. Studies will be implemented as damage assessment data and funding become available.

The scientific literature and experience from oil spills other than the Exxon Valdez will provide background on restoration and information from other oil spill experiences. In 1991, the Restoration Planning Work Group expects to synthesize previously identified literature on restoration (see Appendix B, August 1990 Progress Report) and to initiate syntheses of literature on species and ecosystem recoveries following anthropogenic and natural environmental disturbances.

Public participation will continue to be an important component of restoration planning in 1991. The Restoration Planning Work Group is interested in and available for meetings with individuals or constituency groups. In addition, the Trustees will consider whether and what additional actions, such as publications and workshops, are appropriate and possible in 1991. Requests and suggestions from the public are invited.

1991 Restoration Implementation Activities: Where the nature of the resource injury is reasonably clear, it is desirable to begin restoration prior to receipt of funds from the parties responsible for the oil spill. Failure to undertake timely restoration may allow damages initiated by the spill to continue or accelerate, as in the case of the loss of stabilizing vegetation on beaches. In other cases, prompt action to acquire strategic habitats subject to such human activities, such as logging or gravel removal, could reduce cumulative stress and expedite the recovery of spill-injured resources and services. Accelerated implementation of some restoration activities may thus be required if injured resources are to avoid further degradation and injury and recover as quickly and fully as possible.

The restoration activities being considered by the Trustee agencies for implementation in 1991 are listed below and described more fully in Appendix B. Before making final decisions, the Trustees are prepared to conduct public meetings in some of the oil spill communities, if requested to do so. The projects now under consideration are:

1. Salmonid Habitat Rehabilitation Projects
2. Restoration of the Beach Wildrye Community
3. Public Education Restoration Projects
4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites.

Recovery Monitoring: With the assistance of restoration and damage assessment scientists and other experts, a plan to monitor the recovery of injured resources will be designed and implemented. Information on the adequacy of natural recovery is central to determining whether to implement restoration actions or to allow injured resources to recover on their own. Monitoring is also important in evaluating the effectiveness of implemented restoration activities to identify when and where additional restoration activities may be appropriate.

Recovery monitoring often requires a determination of species distribution, abundance, diversity, growth, reproductive success, and other physiological/biochemical properties. In some cases, it is appropriate to indirectly determine the degree of recovery by measuring exposure (presence of oil residuals and/or metabolites) and by applying knowledge of toxicological effects derived from the oil spill literature. For these reasons, the recovery of injured resources can best be followed by implementing a balanced program of monitoring.

Recovery monitoring activities will be reduced in scope compared to the current natural resource damage assessment program. The duration of recovery monitoring will depend on the time necessary to establish a trend for recovery, and this in turn will necessarily depend on the severity and duration of effects resulting from the oil spill. This may be expected to extend over a period of several years in cases of long-living, slow-reproducing biota.

Funding for the 1991 Restoration Work Plan: Although it is expected that the responsible parties will pay for the costs of the damage assessment and restoration program, there is no certainty about the final amount and when such funds will be forthcoming. It is likely, therefore, that funds to carry out the 1991 Restoration Work Plan, including the proposed planning and implementation activities, will have to be advanced by the state and federal governments. To date, those funds have not been committed or secured by either government.

The federal Trustee agencies and EPA are now evaluating what federal funds might be available to carry out the 1991 Restoration Work Plan. With respect to restoration implementation activities, the State's Trustee has requested \$43,146,000 for 1991 restoration projects. For planning activities, including feasibility and technical support



studies and other restoration planning activities, the State Trustee has requested a total of \$3,636,000.

References: The following documents provide additional information on damage assessment and restoration and are available from the Oil Spill Public Information Center [insert address]:

1. The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill, Volume I Assessment and Restoration Plan Appendices A,B,C.
2. State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill, August 1989.
3. Restoration Planning following the Exxon Valdez Oil Spill - August 1990 Progress Report.
4. Restoration following the Exxon Vadez Oil Spill - Proceedings of the Public Symposium.

**APPENDIX A: 1990 RESTORATION FEASIBILITY STUDIES AND TECHNICAL SUPPORT PROJECTS**

*Feasibility Study Number 1: Reestablishment of Fucus in Rocky Intertidal Ecosystems. (Lead Agency - U.S. Environmental Protection Agency).* Early observations indicated that Fucus, a marine plant (rockweed) found on rocky shorelines in the intertidal zone throughout the oil spill area, was extensively damaged by both the spilled oil and cleanup efforts. This study was designed to field test the feasibility of enhancing the re-establishment of Fucus and to document its natural recovery under various conditions. If the natural recovery of Fucus could be significantly accelerated or enhanced it would benefit the recovery of associated flora and fauna on intertidal rocky shores

Specific objectives of this study were to identify the causes of variation in Fucus recovery at and near Herring Bay on Knight Island in Prince William Sound, and to document the effects of alternative cleaning methods on Fucus. Data from samples collected in mid-September 1990 were used to compare non-oiled control areas to sites that were cleaned in different ways after the spill. Sampling parameters included percent cover, density, size, and attachment of Fucus, nearest adult Fucus, density of grazers, cover of barnacles, abundance of various substratum relief categories, slope, and cover of tar. Though results are preliminary at this time, it appears that Fucus recovers slowest in the intensely cleaned sites, and that almost no recovery has occurred where tar cover persists.

*Feasibility Study Number 2: Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems. (Lead Agency - U.S. Forest Service).* This feasibility study is designed to compare the rates of faunal recovery in rocky intertidal communities, and to demonstrate the feasibility of potential restoration of these communities by enhancing recolonization rates for such key species as limpets and starfish. Recolonization rates for these organisms and for the algae, Fucus, may limit the natural rates of recovery for the entire community. Parameters examined included the presence or absence of common intertidal species on impacted and reference sites, population dynamics of several species of invertebrates, larval settlement on oiled versus non-oiled surfaces, and differences in algal grazing by limpets between oiled and referenced sites.

*Feasibility Study Number 3: Identification of Potential Sites for Stabilization and Restoration with Beach Wildrye (Lead Agency - Alaska Department of Natural Resources).* This study was designed to identify sites at which damage to beach wildrye grass has occurred, and to recommend restoration

measures. This species was affected by both spilled oil and subsequent cleanup activities. Beach wildrye grass is important in the prevention of erosion in the coastal environment and is a key component of supratidal habitats in locations throughout the oil-spill area. Erosion resulting from loss of beach wildrye can lead to the destabilization and degradation of wildlife habitats and of cultural and recreational sites.

Survey work during 1990 in Prince William Sound confirmed damage to several wildrye grass communities. Restoration measures recommended for further study include various combinations of transplanting and fertilization.

*Feasibility Study Number 4: Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill (Lead Agencies - USFWS, ADF&G).* A variety of bird and mammals were killed by the spill or injured by contamination of prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for activities such as feeding and resting, but many also use upland habitats in forests, along streams, or above the tree line. In the public and technical consultations, many people suggested that protection of upland habitats from further degradation may reduce cumulative effects on injured fish and wildlife populations, and thereby help them recover from the effects of the oil spill. This study focused specifically on marbled murrelets and harlequin ducks, two species known to have been affected by the spill and known to use upland habitats.

Based on surveys of 140 streams, preliminary results of the harlequin duck study indicate that this species nests along larger-than-average anadromous fish streams, with moderate gradients and clear waters. Preliminary results on murrelets suggest that murrelets use slopes facing north or west, and inland areas at the heads of bays as opposed to the outer peninsulas. Open bog meadows, especially at the heads of bays, appear to be used as flight corridors to upper wooded areas.

*Feasibility Study Number 5: Land Status, Uses, and Management Plans in Relation to Natural Resources and Services (Lead Agency - Alaska Department of Natural Resources).* This study, which is in progress, is designed to summarize existing information about resource values in relation to the current ownership status and uses, present and planned, of public and private lands in the spill area. This information will be necessary if habitat protection or acquisition is determined to be appropriate for restoration.

*Technical Support Project 1: Peer Reviewer Process for Restoration Feasibility Studies (Lead Agency - Restoration Planning Work Group).* This project provided funds to ensure that scientists with expertise on natural resource restoration were available to provide peer review of

restoration feasibility projects and other restoration planning studies and activities.

*Technical Support Project 2: Assessment of Beach Segment Survey Data (Lead Agency - ADNR).* This study, which is in progress, is reviewing and summarizes response-related beach survey information on potential restoration sites. To date, more than twenty digital databases have been reviewed.

*Technical Support Project 3: Development of Potential Feasibility Studies for 1991 (Lead Agencies - ADF&G, EPA).* This project provided for the orderly development of additional feasibility studies including the following are examples: a) monitoring "natural" recoveries; b) pink salmon stock identification; c) herring stock identification/spawning site inventory; d) artificial reefs for fish and shellfish; e) alternative recreation sites and facilities; f) historic sites and artifacts; and g) availability of forage fish. Currently, proposals are under consideration for all of the above. A limited study evaluating techniques to determine the availability of forage fish was conducted in 1990, preliminary to conducting an actual feasibility study.

**APPENDIX B: 1991 RESTORATION IMPLEMENTATION  
ACTIVITIES**

Project 1: Restoration of the Beach Wildrye Community  
Lead Agency: DEC, USFS

Need and Objectives

The high intertidal-supratidal beach wildrye grass (Elymus arenarius, E. mollis) communities show signs of localized injury as a result of the Exxon Valdez oil spill and the associated clean-up activities. The injury appears to have resulted primarily from the stress of mechanical abrasion and removal by clean-up workers and equipment. Beach wildrye grass is a major component of maintaining natural beach stability. Injury to this important plant community may result in accelerated erosion of the beaches and adjacent upland plant communities. Also at risk from increased erosion are several nearshore archaeological sites.

Once the beach wildrye root masses are disturbed, natural recovery may be slow, taking several years. Wildrye recolonizes primarily by spreading outward from undamaged plants, and this process can be stopped altogether if the rate of erosion is too great. This may result in a significant loss of intertidal and supratidal area. Restoration intervention may often restabilize a beach in one growing season.

The objective of this project is to determine the sites for restoration following the 1991 Spring Shoreline Assessment, and to stabilize injured sites where natural or cultural resources are at risk.

Methods:

Replanting beach wildrye for stabilization is a proven technology. Nearby healthy stocks of beach wildrye grass will be used as a source of donor material. After replanting, fertilizer will be applied (20-20-10 fertilizer up to 800 pounds per acre) to help the transplanted beach wildrye grass recolonize. At some locations fertilizer alone may be sufficient to encourage existing injured plant communities to recover without transplanting new stock.

Estimated 1991 Cost: \$180,000

Project 2: Public Information and Education for Recovery  
and Protection of Alaska's Marine/Coastal  
Resources.  
Lead Agency: USFWS, NPS

Need and Objectives:

The Exxon Valdez oil spill caused direct and indirect injury to the marine and coastal resources of southcentral Alaska. Impacts have been documented on birds, mammals, fish, invertebrates, and cultural and recreational opportunities. At the same time, advertisements promoting recreation, hunting, and fishing opportunities in the affected area may bring additional people to the area. This has the potential to increase the human disturbance to resources of the area. The purpose of this project is to make users of the area aware of the changes to the ecosystem and to diminish stresses to the ecosystem or ecosystem components. This will be accomplished by providing information that will contribute to a greater understanding of potential human impacts, and the importance of increased conservation and protection of the coastal and marine resources. The project objectives are to incorporate the use of various public education techniques to encourage a stewardship approach by those people using the area affected by the Exxon Valdez oil spill.

Methods:

Print media such as art-quality posters, brochures and, possibly, books will be produced. Consideration will also be given to the production of an informational videotape and school curricula.

The distribution of the printed media will be by way of traditional outlets such as refuge and park visitors' centers, tourist information centers and airports. Other distribution sites will be used as well, including commercial boat and airline operations, industry training sessions, and state and federal agency programs.

The media content will focus on such problems as disturbance of marine birds and mammals. The content will address public awareness of individual species' requirements to minimize disturbances.

Some species identification information will be included, but the content of the media will emphasize strategies to allow public use and enjoyment of resources while preventing disturbances. The primary emphasis will be on marine birds and mammals; however, protection of other resources such as cultural and archaeological sites and recreation will also receive attention.

Estimated 1991 Cost: \$100,000.

Project 3: Salmonid Stocks and Habitat Restoration  
Project

Lead Agencies: ADF&G, USFS

Need and Objectives:

Spawning and nursery areas of wild stocks of pink and chum salmon which were impacted by the Exxon Valdez oil spill occur throughout Prince William Sound, lower Cook Inlet, and

the Gulf of Alaska. Both wild and hatchery stocks of pink and chum salmon are exploited by subsistence, commercial, and sport fisheries in addition to being major components of the food chain. Genetically unique wild salmon stocks which sustained injury as a result of the Exxon Valdez oil spill may be lost unless specific restoration measures are quickly implemented. These wild salmon stocks can be restored through a mix of population, stock specific, and habitat rehabilitation projects. The main objective of this project is site specific rehabilitation of salmon spawning and rearing habitats which will result in net benefits to specific salmon stocks and thus to the ecosystem as a whole. This will in turn benefit local communities in the affected regions.

Methods:

The Salmonid Stocks and Habitat Restoration Project consists of several proven fisheries enhancement techniques that may be applied immediately. In addition to those sites and streams at which potential rehabilitation activities already have been identified, a survey of affected salmon spawning habitat within the oil spill area will be conducted in 1991 to determine additional restoration measures. The proposed techniques include fish passage through stream channelization or fish ladders to overcome physical and hydrological barriers and construction of spawning channels. All of these measures provide oil-free spawning areas to replace oil-impacted spawning areas. Additional wild salmon stock restoration measures include remote egg-taking and incubation at existing hatcheries for ultimate fry release in oil-impacted streams. Other measures may include optimal fry release programs that will enhance marine survival of juvenile salmonids.

Estimated 1991 Cost: \$1,300,000

Project 4: Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead Agencies: ADF&G, USDOJ, USDOA, ADNR

Need and Objectives:

The marine and intertidal habitats where most oil-spill injuries occurred are ecologically linked to adjacent uplands. The water quality in streams and estuaries where salmon spawn depends on the surrounding forests. Eagles nest in large trees along the coasts or streams, and marbled murrelets nest in association with forested uplands. Harlequin ducks nest in riparian habitats and feed in the streams as well as in nearby intertidal and estuarine areas.

Recreation and tourism also depend on the quality and accessibility of shorelines, uplands, and fishing streams. The diversity, productivity, and uses of intertidal and estuarine habitats, and of freshwater streams along the coast depend on the ecological integrity of the adjacent uplands. Continued productivity in the undamaged parts of the regional ecosystem--including marine, intertidal, and estuarine habitats and adjacent uplands--may be necessary for the efficient recovery of biological communities that were injured.

During the public scoping process the governments received repeated suggestions that they acquire or otherwise protect prime fish and wildlife habitats, recreation sites, and forested uplands as part of the restoration program. Logging and road building and other activities are likely to modify the environment on some private land in the oil-spill area in 1991 and 1992. Although such activities are often appropriate and ecologically acceptable, in the post-Exxon Valdez environment they may slow or negate the recovery of spill-injured resources and services.

The objectives of this project are to identify and, where determined appropriate, acquire or otherwise protect - on a willing buyer/willing seller basis - strategic wildlife and fisheries habitats and recreation sites.

This restoration project will be preceded by a technical support project to identify and evaluate potential properties. The overall task of strategic habitat acquisition would embody the following goals:

1. Identification of the lands in private ownership that are linked to recovery, including characterization of habitat and ecological requirements.
2. Characterization and evaluation of threats from changed land use in relation to their effects on recovery of the ecosystem and its components; comparative evaluation of recovery strategies not involving acquisition of property rights.
3. Real estate appraisals, cost benefit analysis, and economic evaluation of the most cost-effective strategy to achieve restoration objectives, i.e., fee simple title, acquisition vs. conservation easements, etc.
4. Willing seller/buyer negotiations with private landowners.
5. Incorporation of acquired property (or property rights) into public management.

The geographic scope of the 1991 habitat-protection program would be the oil-spill area. In the context of developing a final restoration plan, the trustees may undertake a more comprehensive survey of potential acquisitions outside the spill area. The results of the project proposed here would be incorporated into any subsequent acquisition surveys.

Estimated 1991 cost: \$40,150,000





## OIL SPILL RESTORATION PLANNING OFFICE

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437 E Street, Suite 301 Anchorage, Alaska 99501  
(907) 271-2461 FAX: (907) 271-2467

March 7, 1991

Dear Concerned Citizen:

Based on your past interest in the planning of restoration following the Exxon Valdez Oil Spill, we are enclosing, for your information, a copy of this recent notice announcing a draft 1991 Restoration Work Plan. The Restoration Planning Work Group is interested in your continued input in this process and look forward to receiving your comments. On behalf of the Work Group, we appreciate your interest.

Sincerely,

Stanley E. Senner  
Alaska Department of Fish & Game

Linda R. Comerci  
U.S. Environmental Protection Agency

# federal register

Friday  
March 1, 1991

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**Part VII**

**Environmental  
Protection Agency**

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**Prince William Sound and Gulf of Alaska;  
Draft 1991 Restoration Work Plan; Notice**

**ENVIRONMENTAL PROTECTION  
AGENCY**
**[WH-FRL-3910-8]**
**Prince William Sound and Gulf of  
Alaska Restoration**
**AGENCY:** Environmental Protection Agency and the Alaska Department of Law.

**ACTION:** Notice.

**SUMMARY:** The Environmental Protection Agency, acting to coordinate restoration on behalf of the Federal Trustees (the U.S. Departments of Interior and Agriculture and the National Oceanic and Atmospheric Administration), and with the Alaska State Trustees (the Alaska Attorney General as the lead State Trustee and the Alaska Departments of Fish and Game and Environmental Conservation) are publishing here (1) a discussion of the overall process the State and Federal governments intend to follow to enhance and expedite the recovery of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska from the *Exxon Valdez* oil spill and (2) a draft 1991 Restoration Work Plan comprised of restoration planning and implementation activities being considered by the Trustees. The public is invited to comment and to suggest other activities that should be considered by the Trustees in preparing this draft 1991 Restoration Work Plan. Notice of intent to take this action was published in the *Federal Register* in November (55 FR 48160, November 19, 1990).

**DATES:** The Federal and State of Alaska governments will accept comments through April 15, 1991.

**ADDRESSES:** Written comments should be submitted to: Secretary, Restoration Planning Work Group, Oil Spill Restoration Planning Office, 437 "E" Street, Suite 301, Anchorage, Alaska 99501, Phone (907) 271-2461.

**FOR FURTHER INFORMATION CONTACT:** Susan MacMullin at (202) 245-4373.

**SUPPLEMENTARY INFORMATION:**
**I. Introduction**
*Purpose*

The U.S. Departments of Agriculture (DOA) and the Interior (DOI), the National Oceanic & Atmospheric Administration (NOAA), and the Alaska Attorney General, the Alaska Departments of Fish and Game and Environmental Conservation, (hereafter referred to as "the Trustees") and the Environmental Protection Agency (EPA) desire to implement restoration

activities in the areas affected by the *Exxon Valdez* oil spill as soon as practicable. This Notice contains a draft 1991 Restoration Work Plan comprised of restoration planning and initial implementation activities under consideration by the Trustee Council, an Alaska-based intergovernmental group charged by the Trustees with managing the natural resources damage assessment and restoration program for 1991. Restoration activities in 1991 and subsequent years will be undertaken as appropriate, based on the Trustees' increasing understanding of resource injuries and other relevant considerations. Implementation activities in 1991 will not foreclose future restoration options and are not intended to be a complete or comprehensive restoration program. Implementation of all restoration activities will follow appropriate procedures for compliance with applicable State and Federal laws and regulations. The President of the United States has designated EPA to coordinate, on behalf of the Federal Trustees, the long-term restoration of Prince William Sound and other areas affected by the *Exxon Valdez* oil spill. Accordingly, the EPA Administrator is issuing this document as an action under the Clean Water Act and the Alaska Attorney General is working in concert with the EPA under State authority.

Although preparation of the draft 1991 Restoration Work Plan is not required under the Clean Water Act or the laws of Alaska, the Trustees and EPA have chosen to present this document to obtain public comment and to invite suggestions about other restoration activities that should be considered by the State and Federal governments. The public is also invited to comment on the overall process the governments intend to follow in enhancing environmental recovery in Prince William Sound, lower Cook Inlet, and the Gulf of Alaska and achieving restoration of affected resources and services after the *Exxon Valdez* oil spill.

The Trustees expect to complete the assessment of damages, determine liability, and collect funds from the responsible parties before they prepare a final Restoration Plan. Although the Trustees wish to resolve damage assessment and liability issues as promptly as possible, it is not possible to predict when this will occur. Considering this uncertainty, in cases where the nature of the resource injury, loss or destruction [hereinafter referred to as "injury"] is reasonably clear, and where no alternatives would be foreclosed, it may be desirable to begin implementation of certain restoration

activities prior to a final Restoration Plan. As a result, the Trustees are considering implementation in 1991 of activities described in section III of this notice. Other activities related to restoration, such as feasibility studies, technical support projects, and monitoring (see sections 2 and 3), will be considered in the following months and will be presented to the public for review and comment. The Trustees also expect to publish a revised 1991 Restoration Work Plan in the *Federal Register* in Spring 1991. The Trustees also expect subsequently to publish notice of and to solicit public comment on detailed descriptions for each of the restoration projects selected for implementation in 1991.

*Organization of this Notice*

This notice has three main sections: I. Introduction, II. Restoration Planning, and III. Draft 1991 Restoration Work Plan. The Introduction presents a synopsis of the purpose of this notice and background information. Section II, Restoration Planning, describes the overall approach to restoration and reports on the planning activities conducted in 1990. In Section III, this notice provides information on restoration planning and initial implementation actions under consideration for 1991.

*Further Information*

Further information about the *Exxon Valdez* oil spill, the damage assessment studies, and restoration planning activities is contained in the documents referenced at the end of this notice and in the *Federal Register* published on November 19, 1990 (55 FR 48160). These documents and other information on restoration and damage assessment are available from the Oil Spill Public Information Center, 645 G Street, Anchorage, Alaska 99501.

**II. Restoration Planning**
**A. The Planning Process**

The Trustees' and EPA's restoration planning activities are designed to determine appropriate ways to restore natural resources and services injured by the *Exxon Valdez* oil spill. Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the environment to its baseline condition.

The Natural Resource Damage Assessment (NRDA) regulations [43 CFR part 11], which implement certain provisions of CERCLA and CWA, define "restoration" or "rehabilitation" as " \* \* \* actions undertaken [in addition

to response actions], to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided \* \* \*. This definition of restoration from the NRDA regulations is provided here for informational purposes. The NRDA regulations are not mandatory but do provide a model for restoration planning.

The Trustees have determined that restoration after the *Exxon Valdez* oil spill should be subject to continuing review as information is developed about injuries and possible restoration opportunities. The Trustees expect that each year's work will build on the last, and that all information pertinent to the *Exxon Valdez* oil spill will be examined in the course of the restoration process.

#### 1. Steps in the Planning Process

The restoration planning process is a dynamic and evolving process that will generally include the following steps:

a. *Determining the Need for Restoration.* The need for restoration depends on the nature and extent of natural resources injured, lost, or destroyed and the adequacy of natural recovery. The primary information sources regarding resource injury, loss, or destruction are the studies conducted by State and Federal agencies as part of the natural resources damage assessment. These studies are described in the 1989 and 1990 *Exxon Valdez* damage assessment plans (see the documents referenced at the end of this notice). Other sources of information include public comments, data gathered as part of the oil spill response, and other studies conducted by government agencies outside of the damage assessment process.

b. *Identifying Potential Restoration Activities.* For any injury, there are three possible types of restoration which may be used singularly or in any combination:

*Direct restoration* refers to measures in addition to response actions, usually taken on site, to directly restore or rehabilitate an injured, lost, or destroyed resource or otherwise to promote or enhance the recovery of such resources;

*Replacement* refers to substituting one resource for an injured, lost, or destroyed resource of the same or similar type; and

*Acquisition of equivalent resources* means to compensate for an injured, lost, or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource.

Determining the adequacy of natural recovery is fundamental to the choice of a restoration activity. In some cases the Trustees may determine that it is most appropriate to allow natural recovery to proceed without further intervention by man (i.e., no action alternative). The definition of direct restoration includes any administrative actions that may be taken by the Federal or State agencies, such as limiting certain activities in the affected areas, to promote recovery of injured resources.

c. *Evaluating Potential Restoration Alternatives.* Evaluation of potential restoration alternatives will consider such factors as:

- Nature and extent of injury;
- Adequacy of natural recovery;
- Technical feasibility;
- Net environmental benefit (including indirect impacts);
- Cost effectiveness;
- Reasonableness of cost of the restoration project in light of the value or ecological significance of the resource; and
- Results of actual or planned response actions.

Some restoration proposals may be readily evaluated. In other cases additional information, for example, biological, ecological, or resource assessment data, will be gathered to support the evaluation process. The goal of the Trustees and EPA is to conduct restoration planning for the recovery of the injured environment as a whole. In general, priority will be given to alternatives which benefit multiple rather than single species or resources. By necessity, however, individual elements of the restoration program may be species- or resource-specific.

d. *Recommending and Implementing Restoration Activities on a Continuing Basis.* As information about injuries, resources recovery, restoration methods or costs becomes available, certain activities may be recommended and carried out in advance of the receipt of funds for restoration from the parties responsible for the oil spill (see Section III, below).

e. *Presenting a Damage Claim to Parties Responsible for the Oil Spill and Receiving Funds for Restoration.* The damage assessment process initiated by the Trustees is designed to identify and quantify specific resource injuries and determine restoration costs and other corresponding monetary values. The Federal and State governments will present their claims for these amounts to the parties responsible for the oil spill as required by Federal and State law.

f. *Preparing and Implementing a Final Restoration Plan.* When the full amount

of restoration funds that will be recovered has been resolved, final determinations will be made concerning the nature and scope of the remaining phases of restoration.

g. *Evaluating the Effectiveness of Restoration Measures, and Recommending Additional Actions.* Implementation of restoration activities and the success of resource recovery will be monitored and evaluated based on standards appropriate to individual projects and resources to verify that restoration goals have been met. Long-term monitoring activities also may be implemented to verify that the affected area is recovering.

Restoration planning, as outlined above, is underway; the overall pace of restoration is dependent on the availability of information to determine injury and the resolution of a claim for damages. Implementation of restoration and monitoring activities may take a number of years. The Trustees and EPA intend to follow the restoration planning process as outlined above in order to accelerate the restoration of the Prince William Sound-Gulf of Alaska ecosystem and the affected natural resources and services.

#### 2. Public Participation

The Trustees and EPA intend to encourage, provide for, and be responsive to public participation and review during the restoration planning process. Carrying out this intent, however, is complicated by the need for confidentiality with respect to damage assessment information due to pending or possible future litigation with the parties responsible for the *Exxon Valdez* oil spill. Notwithstanding these considerations, the Trustees intend to provide an opportunity for meaningful public review and comment on all restoration implementation activities.

In September of 1990, the Oil Spill Public Information Center was opened in Anchorage to provide the public with scientific data and other information related to the 1989 *Exxon Valdez* oil spill. The Trustees will continue to place information in the center as it becomes available.

#### 3. Restoration Planning Activities in 1990

The Trustees and EPA began to solicit public opinion in March 1990 with a symposium on restoration in Anchorage, Alaska. In April and May of 1990, eight public scoping meetings were held throughout southcentral Alaska to ascertain the public's priorities for the restoration program. For a detailed description of these meetings, see the

documents referenced at the end of this notice. In addition to these public meetings, the governments have communicated individually with such constituencies as Native corporations and villages, fishing groups, and environmental organizations.

To gather specific scientific input for the restoration planning process, technical workshops were held in Anchorage in April 1990. Follow-up meetings were held in October and November 1990. Participants included members of the Restoration Planning Work Group (the Alaska Departments of Fish and Game, Environmental Conservation, and Natural Resources, and the U.S. Departments of Interior and Agriculture, the National Oceanic and Atmospheric Administration, and the U.S. Environmental Protection Agency) Federal and State resource managers, and scientists and technical experts under contract to the governments. Due to the necessary discussion of litigation-sensitive damage assessment information, these workshops were closed to the general public.

The Restoration Planning Work Group completed a preliminary literature search, which identified articles and other published material concerning techniques for ecological restoration following oil spills. Approximately 200 publications were acquired for detailed review and are listed in the August 1990 Progress Report.

The Trustees and EPA initiated several small-scale field studies to evaluate the feasibility of restoration techniques. Results from these studies will help determine the costs and effectiveness of full-scale restoration projects. Several technical support studies were also initiated to provide information needed to evaluate or carry out some potential restoration activities. These studies are described in the "State/Federal Natural Resources Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill," August 1990. The 1990 studies and preliminary results are summarized below.

#### B. 1990 Restoration Feasibility Studies

##### 1. Reestablishment of *Fucus* in Rocky Intertidal Ecosystems

Agencies: U.S. Environmental Protection Agency, U.S. Forest Service.

Early observations indicated that *Fucus*, a marine plant (rockweed) found on rocky shorelines in the intertidal zone throughout the oil spill area, was extensively damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* could be significantly accelerated or enhanced it would

benefit the recovery of associated flora and fauna on intertidal rocky shores.

Specific objectives of this study were to identify the causes of variation in *Fucus* recovery at and near Herring Bay, Knight Island in Prince William Sound; to document the effects of alternative cleaning methods on *Fucus*; and to test the feasibility of enhancing the reestablishment of *Fucus*. Although results are preliminary at this time, it appears that *Fucus* recovers most slowly at the sites that were intensively cleaned and that almost no recovery occurs where tar cover persists.

##### 2. Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems

Agencies: U.S. Forest Service, U.S. Environmental Protection Agency.

This feasibility study was designed to compare the rates of faunal recovery in rocky intertidal communities, and to demonstrate the feasibility of restoration of these communities by enhancing recolonization rates for such key species as limpets and starfish. Recolonization rates for these organisms and for the rockweed, *Fucus*, may limit the natural rates of recovery for the entire community.

Parameters examined included the presence or absence of common intertidal species on impacted and reference sites, population dynamics of several species of invertebrates, larval settlement on oiled versus non-oiled surfaces, and differences in algal grazing by limpets between oiled and referenced sites. Preliminary results indicate that heavy predation of several species of transplanted invertebrates was probably due to the lack of cover usually provided by *Fucus*.

##### 3. Identification of Potential Sites for Stabilization and Restoration With Beach Wildrye

Lead Agency: Alaska Department of Natural Resources, United States Forest Service.

This study was designed to identify sites at which damage to beach wildrye grass has occurred and to recommend restoration measures. This species was affected by both spilled oil and subsequent cleanup activities. Beach wildrye grass is important in the prevention of erosion in the coastal environment and is a key component of supratidal habitats in locations throughout the oil spill area. Erosion resulting from loss of beach wildrye can lead to the destabilization and degradation of wildlife habitats and of cultural and recreational sites. Survey work in 1990 in Prince William Sound indicated injury to several beach rye communities. Following confirmation in the 1991 spring shoreline assessment,

restoration activities can be initiated (see Restoration Project 1 summary).

##### 4. Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill

Agencies: U.S. Fish and Wildlife Service, Alaska Department of Fish and Game.

A diversity of birds, mammals, and other animals were killed by the spill or injured by contamination of prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for activities such as feeding and resting, but many also use upland habitats. Protection of upland habitats from further degradation may reduce cumulative effects on injured fish and wildlife populations, and thereby help them recover from the effects of the oil spill. This study focused specifically on marbled murrelets and harlequin ducks, two species known to have been affected by the spill and known to use upland habitats.

Based on surveys of 140 streams, preliminary results of the harlequin duck study indicate that this species nests along larger-than-average anadromous fish streams, with moderate gradients and clear waters. Preliminary results on murrelets suggest that murrelets use slopes facing north or west, and inland areas at the heads of bays as opposed to the outer peninsulas. Open bog meadows, especially at the heads of bays, appear to be used as flight corridors to upper wooded areas.

##### 5. Land Status, Uses, and Management Plans in Relation to Natural Resources and Services

Agencies: Alaska Department of Natural Resources, U.S. Forest Service, U.S. National Park Service, Alaska Department of Fish and Game.

The objective of this study is to locate, categorize, evaluate, and determine the availability of maps, management plans, and other resource documents relevant to restoration planning throughout the oil-spill region. Resource materials identified will assist in planning for and implementing site-specific restoration activities, including direct restoration, replacement, and the acquisition of equivalent resources.

To date, a variety of documents, maps, and management plans have been identified and are being evaluated; other resource materials are being located. This preliminary project will be completed in Spring 1991. A second phase, directly supporting the proposed Restoration Project Number 4, Protection of Strategic Fish and Wildlife

Habitats and Recreation Sites, is under consideration.

### C. 1990 Technical Support Projects

#### 1. Peer Reviewer Process for Restoration Feasibility Studies

Agencies: Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency.

This project provided funds to ensure that scientists with expertise on natural resource restoration were available to provide peer review of restoration feasibility projects and other restoration planning studies and activities.

#### 2. Assessment of Beach Segment Survey Data

Agencies: Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, U.S. Forest Service, U.S. Park Service, U.S. Environmental Protection Agency.

The objective of this project is to review and summarize beach survey information (obtained through oil spill response activities) to assist in planning for and implementing site-specific restoration activities, particularly in the area of direct restoration. This study was initiated late in 1990 and continues to date.

A master database is being created from that portion of the beach surveys relevant to restoration. The primary sources of this information are the Alaska Departments of Natural Resources and Environmental Conservation. Data from local and regional governments as well as non-governmental sources will also be reviewed and integrated into the system as appropriate. This preliminary project will be completed in Spring 1991.

**3. Development of Potential Feasibility Studies for 1991**  
Agencies: Alaska Department of Fish and Game, U.S. Environmental Protection Agency, Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, U.S. Forest Service, U.S. Department of Fish and Game, U.S. National Park Service, U.S. National Oceanic and Atmospheric Administration.

This project provided for the orderly development of additional feasibility studies including: (a) Monitoring "natural" recoveries; (b) pink salmon stock identification; (c) herring stock identification/spawning site inventory;

(d) artificial reefs for fish and shellfish; (e) alternative recreation sites and facilities; (f) historic sites and artifacts; and (g) availability of forage fish. Currently feasibility study proposals are under consideration for all of the above themes.

### III. 1991 Restoration Work Plan

The Trustees are currently developing and evaluating restoration planning and implementation activities, which will be described in the 1991 Restoration Work Plan to be published in the *Federal Register* later in the Spring. Planning activities will include feasibility studies, technical support studies, and natural recovery monitoring which will be made available to the public for review and comment. Implementation activities that are now under consideration are presented in this section. The Trustees and EPA are asking, through this notice, for public comment on and additional suggestions for restoration planning and implementation activities for 1991. As noted previously, the Trustees and EPA anticipate publishing later this Spring a notice of the restoration projects identified for implementation in 1991. More detailed descriptions for 1991 restoration projects will be made available to the public for comment.

#### A. 1991 Restoration Planning Activities

The fundamental purpose of restoration planning is to identify and evaluate potential restoration implementation activities, in consultation with technical experts and the public. The integration of results from the damage assessment and other information into restoration planning is critical to the success of the oil spill program. As damage assessment results are reviewed and evaluated, the Trustees will identify potential restoration implementation activities and related feasibility and technical support projects. This process involves ongoing consultation with principal investigators for damage assessment studies, agency experts, and outside peer reviewers to review the nature and extent of oil spill injuries in relation to the biology and ecology of injured species, habitats, and ecosystems. A key goal is to identify life history requirements, limiting factors, and environmental processes that are especially sensitive or that may be enhanced.

Section II describes five feasibility studies carried out in 1990, some of which may continue in 1991. The Trustees and EPA are considering additional feasibility and technical support projects in 1991 and, following additional review, intend to discuss

them in the Spring 1991 *Federal Register* Notice. Studies now being considered concern a variety of resources, including pink salmon, tidal marshes, Pacific herring, bald eagles, recreation, and sea otters. Feasibility and technical support studies will be implemented as damage assessment data and funding become available.

The scientific literature and experience from oil spills other than the *Exxon Valdez* will provide background on restoration and information from other oil spills. In 1991, the Restoration Planning Work Group expects to review and evaluate previously identified literature on restoration (see Appendix B, August 1990 Progress Report) and to continue review and evaluation of literature on species and ecosystem recoveries following anthropogenic and natural environmental disturbances.

Information on the adequacy of natural recovery is central to determining whether to implement restoration actions or to allow injured resources to recover on their own. Direct measures of recovery, such as species distribution, abundance, diversity, growth, reproductive success, or other physiological and biochemical properties, may be appropriate monitoring objectives. In some cases, it is appropriate to indirectly determine the degree of recovery by measuring exposure (presence of oil residuals and/or metabolites) and by applying knowledge or toxicological effects derived from the oil spill literature. For these reasons, the recovery of injured resources can best be followed by implementing a balanced program of monitoring. The duration of recovery monitoring will depend on the time necessary to establish a trend for recovery, and this in turn will necessarily depend on the severity and duration of effects resulting from the oil spill.

Some recovery monitoring studies will be considered for implementation in 1991. As with feasibility and technical support projects, these will be discussed in the March 1991 *Federal Register* document.

Public participation will continue to be an important component of restoration planning in 1991. The Restoration Planning Work Group is interested in and will try to accommodate requests for meetings with individuals or groups. In addition, the Trustees will consider whether and what additional actions, such as publications and workshops, are appropriate and possible in 1991. Requests and suggestions from the public are invited.



### B. 1991 Restoration Implementation Activities

Where the nature of the resource injury is reasonably clear, it may be desirable to begin restoration prior to receipt of funds from the parties responsible for the oil spill. There are several reasons why this may be so.

Failure to undertake timely restoration may allow damages initiated by the spill to continue or accelerate, as in the case of the loss of stabilizing vegetation on beaches. In other cases, protection of strategic habitats, subject to land-use changes, can reduce cumulative stresses on injured resources and maintain, in the near term, a full range of restoration options. Finally, the importance of a resource for subsistence, commercial, or recreational purposes may justify prompt restoration action.

The restoration activities being considered by the Trustees for implementation in 1991 are described below. Before making final decisions for the 1991 program, the Trustees are prepared to conduct public meetings in some of the oil spill communities, if requested to do so. Moreover, the Trustees expect to provide further opportunity for public comment on the 1991 restoration projects after detailed descriptions for each project are available. The projects now under consideration for the initial phase of the restoration process are:

#### 1. Restoration of the Beach Wildrye Community

Lead Agencies: Alaska Department of Environmental Conservation, U.S. Forest Service

##### Need and Objectives:

The high intertidal-supratidal beach wildrye grasses (*Elymus arenarius* and *E. mollis*) communities show signs of localized injury as a result of the Exxon Valdez oil spill and the associated cleanup activities. Injury appears to have resulted from oiling and the stress of mechanical abrasion resulting from oil removal operations carried out by cleanup workers and equipment. Beach wildrye grasses are major contributors to natural beach stability. Injury to this important plant community may result in accelerated erosion of the beaches and adjacent upland plant communities. Also at risk from increased erosion are several nearshore archaeological sites.

Once the beach wildrye root masses are disturbed, natural recovery may be slow, taking several years. Wildrye recolonizes primarily by spreading outward from undamaged plants, and this process can be stopped altogether if the rate of erosion is too great. This may result in a significant loss of intertidal

and supratidal area. Restoration intervention may often stabilize a beach in one growing season.

The objective of this project is to stabilize injured sites where natural or cultural resources are at risk. Specific sites for restoration will be chosen following the 1991 Spring Shoreline Assessment. The Department of Environmental Conservation and the Forest Service are also exploring whether this project may more appropriately be carried out under the State/Federal response program.

##### Methods:

Replanting beach wildrye for stabilization is a proven technology. Nearby healthy stocks of beach wildrye grass will be used as a source of donor material. After replanting, fertilizer will be applied (20-20-10 fertilizer up to 800 pounds per acre) to help the transplanted beach wildrye grass recolonize. At some locations fertilizer alone may be sufficient to encourage existing injured plant communities to recover without transplanting new stock.

Estimated 1991 Cost: \$180,000

#### 2. Public Information and Education for Recovery and Protection of Alaska's Marine and Coastal Resources

Lead Agencies: U.S. Fish and Wildlife Service, U.S. National Park Service, Alaska, Department of Environmental Conservation

##### Need and Objectives:

The Exxon Valdez oil spill caused direct and indirect injury to the marine birds and mammals of southcentral Alaska. The purpose of this project is to make users of the area aware of the changes to the ecosystem resulting from the oil spill and to lessen the potential for additional harmful human disturbances.

##### Methods:

The project's sponsors will publish and distribute information explaining the potential adverse impacts of human activities, and the importance of increased conservation and protection of marine birds and mammals in key habitats in the oil spill area. Print media such as posters, brochures, and possibly books and video tapes will be produced. Consideration will also be given to production of material for school curricula.

Print media will be distributed through traditional outlets including but not limited to refuge, park, and tourist information and visitor centers. Additional distribution will occur at airports, boat harbors, commercial tour operators, and to public agency and private industry training staffs.

Some species identification information will be included but the primary content of the media will emphasize strategies to allow public use and enjoyment of marine birds and mammals while preventing harmful disturbances to these species.

Estimated 1991 Cost: \$100,000

#### 3. Salmonid Stocks and Habitat Restoration

Lead Agencies: Alaska Department of Fish and Game, U.S. Forest Service

##### Need and Objectives:

Spawning and nursery areas of wild stocks of pink and chum salmon which were impacted by the Exxon Valdez oil spill occur throughout Prince William Sound, lower Cook Inlet, and the Gulf of Alaska. Pink and chum salmon are major components of the ecosystem, serving as important food sources for other fish, birds, terrestrial and marine mammals. Pink and chum salmon are also harvested by man in subsistence, commercial, and sport fisheries. Since salmon return to the individual streams in which they were born, with little straying to other streams, genetically unique wild salmon stocks will be restored through site specific rehabilitation of salmon spawning and rearing habitats.

##### Methods:

This project consists of several proven fisheries enhancement techniques that may be applied immediately at specific sites. In addition to those sites and streams at which potential rehabilitation activities already have been identified, a survey of affected salmon spawning habitat within the oil spill area will be conducted in 1991 to determine additional restoration measures. The proposed techniques include fish passage through stream channelization or fish ladders to overcome physical and hydrological barriers and construction of spawning channels. All of these measures provide oil-free spawning areas to replace oil-impacted spawning areas. Additional wild salmon stock restoration measures include remote egg-taking and incubation at existing hatcheries for ultimate fry release in oil-impacted streams. Other measures may include optimal fry release programs that will enhance marine survival of juvenile salmonids.

Estimated 1991 Cost: \$1,300,000

#### 4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead Agencies: Alaska Department of Fish and Game, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture

**Need and Objectives:**

The marine and intertidal habitats where most oil spill injuries occurred are ecologically linked to adjacent uplands. The water quality in streams and estuaries where salmon spawn depends on the adjacent uplands. Eagles nest and roost in large trees along the coasts and streams, and marbled murrelets nest in association with forested uplands. Harlequin ducks nest in riparian habitats and feed in the streams as well as in nearby intertidal and estuarine areas. Common and thick-billed murre and other seabirds nest on off-shore islands.

Tourism and recreation activities, such as sport fishing and camping, also depend on the quality and accessibility of shorelines and uplands. The diversity, productivity, and uses of intertidal and estuarine habitats, and of freshwater streams along the coast depend on the ecological integrity of the adjacent uplands. Continued productivity in the undamaged parts of the regional ecosystem, including strategic marine, intertidal, and estuarine habitats and adjacent uplands, may be necessary for the recovery of biological communities that were injured.

During the public scoping process the governments received many restoration suggestions that involved the protection and prime fish and wildlife habitats, recreation sites, and adjacent uplands. Suggested approaches to this protection included land acquisition and changes in management practices.

Land-use activities may occur in the oil spill area in 1991 or 1992. These activities may impact important habitats and recreation sites or slow the recovery of spill-injured resources.

The objective of this project is to identify and protect strategic wildlife and fisheries habitats and recreation sites and to prevent further potential environmental damages to resources injured by the *Exxon Valdez* oil spill. This project will be preceded by a technical support project to identify and evaluate potential properties which if publicly owned will contribute to this objective. Where acquisition of property

rights is determined to be appropriate, they will be acquired on a willing buyer/willing seller basis. Primary considerations in deciding which properties should be acquired during this project will include (1) the nature and immediacy of changes in use that may further affect resources injured by the oil spill and (2) the prospect that failure to act will foreclose restoration opportunities.

The Trustees have developed the following preliminary sequence of steps for use in identifying and protecting strategic fish and wildlife habitats and recreation sites:

1. Identification of key upland habitats that are linked to the recovery of injured resources or services by scientific data or other relevant information.
2. Characterization and evaluation of potential impacts from changed land use in relation to their effects on recovery of the ecosystem and its components; comparative evaluation of recovery strategies not involving acquisition of property rights (e.g., redesignation of land use classification), including an assessment of protection afforded by existing law, regulations, and other alternatives.
3. Evaluation of cost-effective strategies to achieve restoration objectives for key upland habitats, identified through steps one and two above. This would include evaluation of other restoration alternatives for these resource injuries.
4. Willing seller/buyer negotiations with private landowners for property rights.
5. Incorporation of acquired property rights into public management.

Habitat and recreation site acquisition proposals that meet the appropriate evaluation factors for restoration (see section 2) will be identified and assigned by priority for implementation in accordance with this preliminary five-step process and applicable State and Federal laws and regulations.

The geographic scope of the 1991 project will be the oil spill area. Subsequent to this initial effort, the

Trustees will continue to survey potential acquisitions, including acquisitions outside the spill area. Estimated Cost: To be determined

**C. Funding for the 1991 Restoration Work Plan**

Although it is expected that the responsible parties will pay for the costs of the damage assessment and restoration program, there is no certainty about the final amount and when such funds will be forthcoming. It is possible, therefore, that funds to carry out the 1991 Restoration Work Plan, including the proposed planning and implementation activities, will have to be advanced by the State and Federal governments. To date, those funds have not been committed or secured by either government.

**D. References**

The documents listed below provide additional information on damage assessment and restoration. They are available from the Oil Spill Public Information Center, The Simpson Building, 645 G Street, Anchorage, Alaska, 99501.

1. "The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plan for the *Exxon Valdez* Oil Spill, Volume I Assessment and Restoration Plan Appendices A, B, C."
2. "State/Federal Natural Resource Damage Assessment Plan for the *Exxon Valdez* Oil Spill," August 1989.
3. "Restoration Planning following the *Exxon Valdez* Oil Spill: August 1990 Progress Report."
4. "Restoration following the *Exxon Valdez* Oil Spill: Proceedings of the Public Symposium," July 1990.

Dated: February 28, 1991.

Lajuana S. Wilcher,  
Assistant Administrator, Office of Water, U.S.  
Environmental Protection Agency.

Dated: February 25, 1991.

Charles E. Cole,  
Attorney General, State of Alaska.

[FR Doc. 91-5014 Filed 2-28-91; 8:45 am]

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# **federal register**

Friday  
March 1, 1991

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**Part VII**

## **Environmental Protection Agency**

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**Prince William Sound and Gulf of Alaska;  
Draft 1991 Restoration Work Plan; Notice**

VPWG

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**ENVIRONMENTAL PROTECTION  
AGENCY**

(WH-FRL-3910-8)

**Prince William Sound and Gulf of  
Alaska Restoration**
**AGENCY:** Environmental Protection Agency and the Alaska Department of Law.

**ACTION:** Notice.

**SUMMARY:** The Environmental Protection Agency, acting to coordinate restoration on behalf of the Federal Trustees (the U.S. Departments of Interior and Agriculture and the National Oceanic and Atmospheric Administration), and with the Alaska State Trustees (the Alaska Attorney General as the lead State Trustee and the Alaska Departments of Fish and Game and Environmental Conservation) are publishing here (1) a discussion of the overall process the State and Federal governments intend to follow to enhance and expedite the recovery of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska from the *Exxon Valdez* oil spill and (2) a draft 1991 Restoration Work Plan comprised of restoration planning and implementation activities being considered by the Trustees. The public is invited to comment and to suggest other activities that should be considered by the Trustees in preparing this draft 1991 Restoration Work Plan. Notice of intent to take this action was published in the *Federal Register* in November (55 FR 48160, November 19, 1990).

**DATES:** The Federal and State of Alaska governments will accept comments through April 15, 1991.

**ADDRESSES:** Written comments should be submitted to: Secretary, Restoration Planning Work Group, Oil Spill Restoration Planning Office, 437 "E" Street, Suite 301, Anchorage, Alaska 99501. Phone (907) 271-2461.

**FOR FURTHER INFORMATION CONTACT:** Susan MacMullin at (202) 245-4373.

**SUPPLEMENTARY INFORMATION:**
**I. Introduction**
*Purpose*

The U.S. Departments of Agriculture (DOA) and the Interior (DOI), the National Oceanic & Atmospheric Administration (NOAA), and the Alaska Attorney General, the Alaska Departments of Fish and Game and Environmental Conservation, (hereafter referred to as "the Trustees") and the Environmental Protection Agency (EPA) desire to implement restoration

activities in the areas affected by the *Exxon Valdez* oil spill as soon as practicable. This Notice contains a draft 1991 Restoration Work Plan comprised of restoration planning and initial implementation activities under consideration by the Trustee Council, an Alaska-based intergovernmental group charged by the Trustees with managing the natural resources damage assessment and restoration program for 1991. Restoration activities in 1991 and subsequent years will be undertaken as appropriate, based on the Trustees' increasing understanding of resource injuries and other relevant considerations. Implementation activities in 1991 will not foreclose future restoration options and are not intended to be a complete or comprehensive restoration program. Implementation of all restoration activities will follow appropriate procedures for compliance with applicable State and Federal laws and regulations. The President of the United States has designated EPA to coordinate, on behalf of the Federal Trustees, the long-term restoration of Prince William Sound and other areas affected by the *Exxon Valdez* oil spill. Accordingly, the EPA Administrator is issuing this document as an action under the Clean Water Act and the Alaska Attorney General is working in concert with the EPA under State authority.

Although preparation of the draft 1991 Restoration Work Plan is not required under the Clean Water Act or the laws of Alaska, the Trustees and EPA have chosen to present this document to obtain public comment and to invite suggestions about other restoration activities that should be considered by the State and Federal governments. The public is also invited to comment on the overall process the governments intend to follow in enhancing environmental recovery in Prince William Sound, lower Cook Inlet, and the Gulf of Alaska and achieving restoration of affected resources and services after the *Exxon Valdez* oil spill.

The Trustees expect to complete the assessment of damages, determine liability, and collect funds from the responsible parties before they prepare a final Restoration Plan. Although the Trustees wish to resolve damage assessment and liability issues as promptly as possible, it is not possible to predict when this will occur. Considering this uncertainty, in cases where the nature of the resource injury, loss or destruction [hereinafter referred to as "injury"] is reasonably clear, and where no alternatives would be foreclosed, it may be desirable to begin implementation of certain restoration

activities prior to a final Restoration Plan. As a result, the Trustees are considering implementation in 1991 of activities described in section III of this notice. Other activities related to restoration, such as feasibility studies, technical support projects, and monitoring (see sections 2 and 3), will be considered in the following months and will be presented to the public for review and comment. The Trustees also expect to publish a revised 1991 Restoration Work Plan in the *Federal Register* in Spring 1991. The Trustees also expect subsequently to publish notice of and to solicit public comment on detailed descriptions for each of the restoration projects selected for implementation in 1991.

*Organization of this Notice*

This notice has three main sections: I. Introduction, II. Restoration Planning, and III. Draft 1991 Restoration Work Plan. The Introduction presents a synopsis of the purpose of this notice and background information. Section II, Restoration Planning, describes the overall approach to restoration and reports on the planning activities conducted in 1990. In Section III, this notice provides information on restoration planning and initial implementation actions under consideration for 1991.

*Further Information*

Further information about the *Exxon Valdez* oil spill, the damage assessment studies, and restoration planning activities is contained in the documents referenced at the end of this notice and in the *Federal Register* published on November 19, 1990 (55 FR 48160). These documents and other information on restoration and damage assessment are available from the Oil Spill Public Information Center, 645 G Street, Anchorage, Alaska 99501.

**II. Restoration Planning**
**A. The Planning Process**

The Trustees' and EPA's restoration planning activities are designed to determine appropriate ways to restore natural resources and services injured by the *Exxon Valdez* oil spill. Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the environment to its baseline condition.

The Natural Resource Damage Assessment (NRDA) regulations [43 CFR part 11], which implement certain provisions of CERCLA and CWA, define "restoration" or "rehabilitation" as " . . . actions undertaken [in addition

to response actions), to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided. This definition of restoration from the NRDA regulations is provided here for informational purposes. The NRDA regulations are not mandatory but do provide a model for restoration planning.

The Trustees have determined that restoration after the *Exxon Valdez* oil spill should be subject to continuing review as information is developed about injuries and possible restoration opportunities. The Trustees expect that each year's work will build on the last, and that all information pertinent to the *Exxon Valdez* oil spill will be examined in the course of the restoration process.

#### 1. Steps in the Planning Process

The restoration planning process is a dynamic and evolving process that will generally include the following steps:

##### a. Determining the Need for Restoration.

The need for restoration depends on the nature and extent of natural resources injured, lost, or destroyed and the adequacy of natural recovery. The primary information sources regarding resource injury, loss, or destruction are the studies conducted by State and Federal agencies as part of the natural resources damage assessment. These studies are described in the 1989 and 1990 *Exxon Valdez* damage assessment plans (see the documents referenced at the end of this notice). Other sources of information include public comments, data gathered as part of the oil spill response, and other studies conducted by government agencies outside of the damage assessment process.

b. *Identifying Potential Restoration Activities.* For any injury, there are three possible types of restoration which may be used singularly or in any combination:

*Direct restoration* refers to measures in addition to response actions, usually taken on site, to directly restore or rehabilitate an injured, lost, or destroyed resource or otherwise to promote or enhance the recovery of such resources;

*Replacement* refers to substituting one resource for an injured, lost, or destroyed resource of the same or similar type; and

*Acquisition of equivalent resources* means to compensate for an injured, lost, or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource.

Determining the adequacy of natural recovery is fundamental to the choice of a restoration activity. In some cases the Trustees may determine that it is most appropriate to allow natural recovery to proceed without further intervention by man (i.e., no action alternative). The definition of direct restoration includes any administrative actions that may be taken by the Federal or State agencies, such as limiting certain activities in the affected areas, to promote recovery of injured resources.

c. *Evaluating Potential Restoration Alternatives.* Evaluation of potential restoration alternatives will consider such factors as:

- Nature and extent of injury;
- Adequacy of natural recovery;
- Technical feasibility;
- Net environmental benefit (including indirect impacts);
- Cost effectiveness;
- Reasonableness of cost of the restoration project in light of the value or ecological significance of the resource; and
- Results of actual or planned response actions.

Some restoration proposals may be readily evaluated. In other cases additional information, for example, biological, ecological, or resource assessment data, will be gathered to support the evaluation process. The goal of the Trustees and EPA is to conduct restoration planning for the recovery of the injured environment as a whole. In general, priority will be given to alternatives which benefit multiple rather than single species or resources. By necessity, however, individual elements of the restoration program may be species- or resource-specific.

d. *Recommending and Implementing Restoration Activities on a Continuing Basis.* As information about injuries, resources recovery, restoration methods or costs becomes available, certain activities may be recommended and carried out in advance of the receipt of funds for restoration from the parties responsible for the oil spill (see Section III, below).

e. *Presenting a Damage Claim to Parties Responsible for the Oil Spill and Receiving Funds for Restoration.* The damage assessment process initiated by the Trustees is designed to identify and quantify specific resource injuries and determine restoration costs and other corresponding monetary values. The Federal and State governments will present their claims for these amounts to the parties responsible for the oil spill as required by Federal and State law.

f. *Preparing and Implementing a Final Restoration Plan.* When the full amount

of restoration funds that will be recovered has been resolved, final determinations will be made concerning the nature and scope of the remaining phases of restoration.

##### g. *Evaluating the Effectiveness of Restoration Measures, and Recommending Additional Actions.*

Implementation of restoration activities and the success of resource recovery will be monitored and evaluated based on standards appropriate to individual projects and resources to verify that restoration goals have been met. Long-term monitoring activities also may be implemented to verify that the affected area is recovering.

Restoration planning, as outlined above, is underway; the overall pace of restoration is dependent on the availability of information to determine injury and the resolution of a claim for damages. Implementation of restoration and monitoring activities may take a number of years. The Trustees and EPA intend to follow the restoration planning process as outlined above in order to accelerate the restoration of the Prince William Sound-Gulf of Alaska ecosystem and the affected natural resources and services.

#### 2. Public Participation

The Trustees and EPA intend to encourage, provide for, and be responsive to public participation and review during the restoration planning process. Carrying out this intent, however, is complicated by the need for confidentiality with respect to damage assessment information due to pending or possible future litigation with the parties responsible for the *Exxon Valdez* oil spill. Notwithstanding these considerations, the Trustees intend to provide an opportunity for meaningful public review and comment on all restoration implementation activities.

In September of 1990, the Oil Spill Public Information Center was opened in Anchorage to provide the public with scientific data and other information related to the 1989 *Exxon Valdez* oil spill. The Trustees will continue to place information in the center as it becomes available.

#### 3. Restoration Planning Activities in 1990

The Trustees and EPA began to solicit public opinion in March 1990 with a symposium on restoration in Anchorage, Alaska. In April and May of 1990, eight public scoping meetings were held throughout southcentral Alaska to ascertain the public's priorities for the restoration program. For a detailed description of these meetings, see the

documents referenced at the end of this notice. In addition to these public meetings, the governments have communicated individually with such constituencies as Native corporations and villages, fishing groups, and environmental organizations.

To gather specific scientific input for the restoration planning process, technical workshops were held in Anchorage in April 1990. Follow-up meetings were held in October and November 1990. Participants included members of the Restoration Planning Work Group (the Alaska Departments of Fish and Game, Environmental Conservation, and Natural Resources, and the U.S. Departments of Interior and Agriculture, the National Oceanic and Atmospheric Administration, and the U.S. Environmental Protection Agency) Federal and State resource managers, and scientists and technical experts under contract to the governments. Due to the necessary discussion of litigation-sensitive damage assessment information, these workshops were closed to the general public.

The Restoration Planning Work Group completed a preliminary literature search, which identified articles and other published material concerning techniques for ecological restoration following oil spills. Approximately 200 publications were acquired for detailed review and are listed in the August 1990 Progress Report.

The Trustees and EPA initiated several small-scale field studies to evaluate the feasibility of restoration techniques. Results from these studies will help determine the costs and effectiveness of full-scale restoration projects. Several technical support studies were also initiated to provide information needed to evaluate or carry out some potential restoration activities. These studies are described in the "State/Federal Natural Resources Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill," August 1990. The 1990 studies and preliminary results are summarized below.

#### B. 1990 Restoration Feasibility Studies

##### 1. Reestablishment of *Fucus* in Rocky Intertidal Ecosystems

Agencies: U.S. Environmental Protection Agency, U.S. Forest Service.

Early observations indicated that *Fucus*, a marine plant (rockweed) found on rocky shorelines in the intertidal zone throughout the oil spill area, was extensively damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* could be significantly accelerated or enhanced it would

benefit the recovery of associated flora and fauna on intertidal rocky shores.

Specific objectives of this study were to identify the causes of variation in *Fucus* recovery at and near Herring Bay, Knight Island in Prince William Sound; to document the effects of alternative cleaning methods on *Fucus*; and to test the feasibility of enhancing the reestablishment of *Fucus*. Although results are preliminary at this time, it appears that *Fucus* recovers most slowly at the sites that were intensively cleaned and that almost no recovery occurs where tar cover persists.

##### 2. Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems

Agencies: U.S. Forest Service, U.S. Environmental Protection Agency.

This feasibility study was designed to compare the rates of faunal recovery in rocky intertidal communities, and to demonstrate the feasibility of restoration of these communities by enhancing recolonization rates for such key species as limpets and starfish. Recolonization rates for these organisms and for the rockweed, *Fucus*, may limit the natural rates of recovery for the entire community.

Parameters examined included the presence or absence of common intertidal species on impacted and reference sites, population dynamics of several species of invertebrates, larval settlement on oiled versus non-oiled surfaces, and differences in algal grazing by limpets between oiled and referenced sites. Preliminary results indicate that heavy predation of several species of transplanted invertebrates was probably due to the lack of cover usually provided by *Fucus*.

##### 3. Identification of Potential Sites for Stabilization and Restoration With Beach Wildrye

Lead Agency: Alaska Department of Natural Resources, United States Forest Service.

This study was designed to identify sites at which damage to beach wildrye grass has occurred and to recommend restoration measures. This species was affected by both spilled oil and subsequent cleanup activities. Beach wildrye grass is important in the prevention of erosion in the coastal environment and is a key component of supratidal habitats in locations throughout the oil spill area. Erosion resulting from loss of beach wildrye can lead to the destabilization and degradation of wildlife habitats and of cultural and recreational sites. Survey work in 1990 in Prince William Sound indicated injury to several beach rye communities. Following confirmation in the 1991 spring shoreline assessment,

restoration activities can be initiated (see Restoration Project 1 summary).

##### 4. Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill

Agencies: U.S. Fish and Wildlife Service, Alaska Department of Fish and Game.

A diversity of birds, mammals, and other animals were killed by the spill or injured by contamination of prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for activities such as feeding and resting, but many also use upland habitats. Protection of upland habitats from further degradation may reduce cumulative effects on injured fish and wildlife populations, and thereby help them recover from the effects of the oil spill. This study focused specifically on marbled murrelets and harlequin ducks, two species known to have been affected by the spill and known to use upland habitats.

Based on surveys of 140 streams, preliminary results of the harlequin duck study indicate that this species nests along larger-than-average anadromous fish streams, with moderate gradients and clear waters. Preliminary results on murrelets suggest that murrelets use slopes facing north or west, and inland areas at the heads of bays as opposed to the outer peninsulas. Open bog meadows, especially at the heads of bays, appear to be used as flight corridors to upper wooded areas.

##### 5. Land Status, Uses, and Management Plans in Relation to Natural Resources and Services

Agencies: Alaska Department of Natural Resources, U.S. Forest Service, U.S. National Park Service, Alaska Department of Fish and Game.

The objective of this study is to locate, categorize, evaluate, and determine the availability of maps, management plans, and other resource documents relevant to restoration planning throughout the oil-spill region. Resource materials identified will assist in planning for and implementing site-specific restoration activities, including direct restoration, replacement, and the acquisition of equivalent resources.

To date, a variety of documents, maps, and management plans have been identified and are being evaluated; other resource materials are being located. This preliminary project will be completed in Spring 1991. A second phase, directly supporting the proposed Restoration Project Number 4, Protection of Strategic Fish and Wildlife

Habitats and Recreation Sites, is under consideration.

### C. 1990 Technical Support Projects

#### 1. Peer Reviewer Process for Restoration Feasibility Studies

Agencies: Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency.

This project provided funds to ensure that scientists with expertise on natural resource restoration were available to provide peer review of restoration feasibility projects and other restoration planning studies and activities.

#### 2. Assessment of Beach Segment Survey Data

Agencies: Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, U.S. Forest Service, U.S. Park Service, U.S. Environmental Protection Agency.

The objective of this project is to review and summarize beach survey information (obtained through oil spill response activities) to assist in planning for and implementing site-specific restoration activities, particularly in the area of direct restoration. This study was initiated late in 1990 and continues to date.

A master database is being created from that portion of the beach surveys relevant to restoration. The primary sources of this information are the Alaska Departments of Natural Resources and Environmental Conservation. Data from local and regional governments as well as non-governmental sources will also be reviewed and integrated into the system as appropriate. This preliminary project will be completed in Spring 1991.

3. Development of Potential Feasibility Studies for 1991 Agencies: Alaska Department of Fish and Game, U.S. Environmental Protection Agency, Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, U.S. Forest Service, U.S. Department of Fish and Game, U.S. National Park Service, U.S. National Oceanic and Atmospheric Administration.

This project provided for the orderly development of additional feasibility studies including: (a) Monitoring "natural" recoveries; (b) pink salmon stock identification; (c) herring stock identification/spawning site inventory;

(d) artificial reefs for fish and shellfish; (e) alternative recreation sites and facilities; (f) historic sites and artifacts; and (g) availability of forage fish. Currently feasibility study proposals are under consideration for all of the above themes.

### III. 1991 Restoration Work Plan

The Trustees are currently developing and evaluating restoration planning and implementation activities, which will be described in the 1991 Restoration Work Plan to be published in the *Federal Register* later in the Spring. Planning activities will include feasibility studies, technical support studies, and natural recovery monitoring which will be made available to the public for review and comment. Implementation activities that are now under consideration are presented in this section. The Trustees and EPA are asking, through this notice, for public comment on and additional suggestions for restoration planning and implementation activities for 1991. As noted previously, the Trustees and EPA anticipate publishing later this Spring a notice of the restoration projects identified for implementation in 1991. More detailed descriptions for 1991 restoration projects will be made available to the public for comment.

#### A. 1991 Restoration Planning Activities

The fundamental purpose of restoration planning is to identify and evaluate potential restoration implementation activities, in consultation with technical experts and the public. The integration of results from the damage assessment and other information into restoration planning is critical to the success of the oil spill program. As damage assessment results are reviewed and evaluated, the Trustees will identify potential restoration implementation activities and related feasibility and technical support projects. This process involves ongoing consultation with principal investigators for damage assessment studies, agency experts, and outside peer reviewers to review the nature and extent of oil spill injuries in relation to the biology and ecology of injured species, habitats, and ecosystems. A key goal is to identify life history requirements, limiting factors, and environmental processes that are especially sensitive or that may be enhanced.

Section II describes five feasibility studies carried out in 1990, some of which may continue in 1991. The Trustees and EPA are considering additional feasibility and technical support projects in 1991 and, following additional review, intend to discuss

them in the Spring 1991 *Federal Register* Notice. Studies now being considered concern a variety of resources, including pink salmon, tidal marshes, Pacific herring, bald eagles, recreation, and sea otters. Feasibility and technical support studies will be implemented as damage assessment data and funding become available.

The scientific literature and experience from oil spills other than the *Exxon Valdez* will provide background on restoration and information from other oil spills. In 1991, the Restoration Planning Work Group expects to review and evaluate previously identified literature on restoration (see Appendix B, August 1990 Progress Report) and to continue review and evaluation of literature on species and ecosystem recoveries following anthropogenic and natural environmental disturbances.

Information on the adequacy of natural recovery is central to determining whether to implement restoration actions or to allow injured resources to recover on their own. Direct measures of recovery, such as species distribution, abundance, diversity, growth, reproductive success, or other physiological and biochemical properties, may be appropriate monitoring objectives. In some cases, it is appropriate to indirectly determine the degree of recovery by measuring exposure (presence of oil residuals and/or metabolites) and by applying knowledge or toxicological effects derived from the oil spill literature. For these reasons, the recovery of injured resources can best be followed by implementing a balanced program of monitoring. The duration of recovery monitoring will depend on the time necessary to establish a trend for recovery, and this in turn will necessarily depend on the severity and duration of effects resulting from the oil spill.

Some recovery monitoring studies will be considered for implementation in 1991. As with feasibility and technical support projects, these will be discussed in the March 1991 *Federal Register* document.

Public participation will continue to be an important component of restoration planning in 1991. The Restoration Planning Work Group is interested in and will try to accommodate requests for meetings with individuals or groups. In addition, the Trustees will consider whether and what additional actions, such as publications and workshops, are appropriate and possible in 1991. Requests and suggestions from the public are invited.

### B. 1991 Restoration Implementation Activities

Where the nature of the resource injury is reasonably clear, it may be desirable to begin restoration prior to receipt of funds from the parties responsible for the oil spill. There are several reasons why this may be so.

Failure to undertake timely restoration may allow damages initiated by the spill to continue or accelerate, as in the case of the loss of stabilizing vegetation on beaches. In other cases, protection of strategic habitats, subject to land-use changes, can reduce cumulative stresses on injured resources and maintain, in the near term, a full range of restoration options. Finally, the importance of a resource for subsistence, commercial, or recreational purposes may justify prompt restoration action.

The restoration activities being considered by the Trustees for implementation in 1991 are described below. Before making final decisions for the 1991 program, the Trustees are prepared to conduct public meetings in some of the oil spill communities, if requested to do so. Moreover, the Trustees expect to provide further opportunity for public comment on the 1991 restoration projects after detailed descriptions for each project are available. The projects now under consideration for the initial phase of the restoration process are:

#### 1. Restoration of the Beach Wildrye Community

Lead Agencies: Alaska Department of Environmental Conservation, U.S. Forest Service

##### Need and Objectives:

The high intertidal-supratidal beach wildrye grasses (*Elymus arenarius* and *E. mollis*) communities show signs of localized injury as a result of the Exxon Valdez oil spill and the associated cleanup activities. Injury appears to have resulted from oiling and the stress of mechanical abrasion resulting from oil removal operations carried out by cleanup workers and equipment. Beach wildrye grasses are major contributors to natural beach stability. Injury to this important plant community may result in accelerated erosion of the beaches and adjacent upland plant communities. Also at risk from increased erosion are several nearshore archaeological sites.

Once the beach wildrye root masses are disturbed, natural recovery may be slow, taking several years. Wildrye recolonizes primarily by spreading outward from undamaged plants, and this process can be stopped altogether if the rate of erosion is too great. This may result in a significant loss of intertidal

and supratidal area. Restoration intervention may often stabilize a beach in one growing season.

The objective of this project is to stabilize injured sites where natural or cultural resources are at risk. Specific sites for restoration will be chosen following the 1991 Spring Shoreline Assessment. The Department of Environmental Conservation and the Forest Service are also exploring whether this project may more appropriately be carried out under the State/Federal response program.

##### Methods:

Replanting beach wildrye for stabilization is a proven technology. Nearby healthy stocks of beach wildrye grass will be used as a source of donor material. After replanting, fertilizer will be applied (20-20-10 fertilizer up to 800 pounds per acre) to help the transplanted beach wildrye grass recolonize. At some locations fertilizer alone may be sufficient to encourage existing injured plant communities to recover without transplanting new stock.

Estimated 1991 Cost: \$180,000

#### 2. Public Information and Education for Recovery and Protection of Alaska's Marine and Coastal Resources

Lead Agencies: U.S. Fish and Wildlife Service, U.S. National Park Service, Alaska, Department of Environmental Conservation

##### Need and Objectives:

The Exxon Valdez oil spill caused direct and indirect injury to the marine birds and mammals of southcentral Alaska. The purpose of this project is to make users of the area aware of the changes to the ecosystem resulting from the oil spill and to lessen the potential for additional harmful human disturbances.

##### Methods:

The project's sponsors will publish and distribute information explaining the potential adverse impacts of human activities, and the importance of increased conservation and protection of marine birds and mammals in key habitats in the oil spill area. Print media such as posters, brochures, and possibly books and video tapes will be produced. Consideration will also be given to production of material for school curricula.

Print media will be distributed through traditional outlets including but not limited to refuge, park, and tourist information and visitor centers. Additional distribution will occur at airports, boat harbors, commercial tour operators, and to public agency and private industry training staffs.

Some species identification information will be included but the primary content of the media will emphasize strategies to allow public use and enjoyment of marine birds and mammals while preventing harmful disturbances to these species. Estimated 1991 Cost: \$100,000

#### 3. Salmonid Stocks and Habitat Restoration

Lead Agencies: Alaska Department of Fish and Game, U.S. Forest Service

##### Need and Objectives:

Spawning and nursery areas of wild stocks of pink and chum salmon which were impacted by the Exxon Valdez oil spill occur throughout Prince William Sound, lower Cook Inlet, and the Gulf of Alaska. Pink and chum salmon are major components of the ecosystem, serving as important food sources for other fish, birds, terrestrial and marine mammals. Pink and chum salmon are also harvested by man in subsistence, commercial, and sport fisheries. Since salmon return to the individual streams in which they were born, with little straying to other streams, genetically unique wild salmon stocks will be restored through site specific rehabilitation of salmon spawning and rearing habitats.

##### Methods:

This project consists of several proven fisheries enhancement techniques that may be applied immediately at specific sites. In addition to those sites and streams at which potential rehabilitation activities already have been identified, a survey of affected salmon spawning habitat within the oil spill area will be conducted in 1991 to determine additional restoration measures. The proposed techniques include fish passage through stream channelization or fish ladders to overcome physical and hydrological barriers and construction of spawning channels. All of these measures provide oil-free spawning areas to replace oil-impacted spawning areas. Additional wild salmon stock restoration measures include remote egg-taking and incubation at existing hatcheries for ultimate fry release in oil-impacted streams. Other measures may include optimal fry release programs that will enhance marine survival of juvenile salmonids.

Estimated 1991 Cost: \$1,300,000

#### 4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead Agencies: Alaska Department of Fish and Game, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture

**Need and Objectives:**

The marine and intertidal habitats where most oil spill injuries occurred are ecologically linked to adjacent uplands. The water quality in streams and estuaries where salmon spawn depends on the adjacent uplands. Eagles nest and roost in large trees along the coasts and streams, and marbled murrelets nest in association with forested uplands. Harlequin ducks nest in riparian habitats and feed in the streams as well as in nearby intertidal and estuarine areas. Common and thick-billed murres and other seabirds nest on off-shore islands.

Tourism and recreation activities, such as sport fishing and camping, also depend on the quality and accessibility of shorelines and uplands. The diversity, productivity, and uses of intertidal and estuarine habitats, and of freshwater streams along the coast depend on the ecological integrity of the adjacent uplands. Continued productivity in the undamaged parts of the regional ecosystem, including strategic marine, intertidal, and estuarine habitats and adjacent uplands, may be necessary for the recovery of biological communities that were injured.

During the public scoping process the governments received many restoration suggestions that involved the protection and prime fish and wildlife habitats, recreation sites, and adjacent uplands. Suggested approaches to this protection included land acquisition and changes in management practices.

Land-use activities may occur in the oil spill area in 1991 or 1992. These activities may impact important habitats and recreation sites or slow the recovery of spill-injured resources.

The objective of this project is to identify and protect strategic wildlife and fisheries habitats and recreation sites and to prevent further potential environmental damages to resources injured by the *Exxon Valdez* oil spill. This project will be preceded by a technical support project to identify and evaluate potential properties which if publicly owned will contribute to this objective. Where acquisition of property

rights is determined to be appropriate, they will be acquired on a willing buyer/willing seller basis. Primary considerations in deciding which properties should be acquired during this project will include (1) the nature and immediacy of changes in use that may further affect resources injured by the oil spill and (2) the prospect that failure to act will foreclose restoration opportunities.

The Trustees have developed the following preliminary sequence of steps for use in identifying and protecting strategic fish and wildlife habitats and recreation sites:

1. Identification of key upland habitats that are linked to the recovery of injured resources or services by scientific data or other relevant information.
2. Characterization and evaluation of potential impacts from changed land use in relation to their effects on recovery of the ecosystem and its components; comparative evaluation of recovery strategies not involving acquisition of property rights (e.g., redesignation of land use classification), including an assessment of protection afforded by existing law, regulations, and other alternatives.
3. Evaluation of cost-effective strategies to achieve restoration objectives for key upland habitats, identified through steps one and two above. This would include evaluation of other restoration alternatives for these resource injuries.
4. Willing seller/buyer negotiations with private landowners for property rights.
5. Incorporation of acquired property rights into public management.

Habitat and recreation site acquisition proposals that meet the appropriate evaluation factors for restoration (see section 2) will be identified and assigned by priority for implementation in accordance with this preliminary five-step process and applicable State and Federal laws and regulations.

The geographic scope of the 1991 project will be the oil spill area. Subsequent to this initial effort, the

Trustees will continue to survey potential acquisitions, including acquisitions outside the spill area. Estimated Cost: To be determined

**C. Funding for the 1991 Restoration Work Plan**

Although it is expected that the responsible parties will pay for the costs of the damage assessment and restoration program, there is no certainty about the final amount and when such funds will be forthcoming. It is possible, therefore, that funds to carry out the 1991 Restoration Work Plan, including the proposed planning and implementation activities, will have to be advanced by the State and Federal governments. To date, those funds have not been committed or secured by either government.

**D. References**

The documents listed below provide additional information on damage assessment and restoration. They are available from the Oil Spill Public Information Center, The Simpson Building, 645 G Street, Anchorage, Alaska, 99501.

1. "The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plan for the *Exxon Valdez* Oil Spill, Volume I Assessment and Restoration Plan Appendices A, B, C."
2. "State/Federal Natural Resource Damage Assessment Plan for the *Exxon Valdez* Oil Spill," August 1989.
3. "Restoration Planning following the *Exxon Valdez* Oil Spill: August 1990 Progress Report."
4. "Restoration following the *Exxon Valdez* Oil Spill: Proceedings of the Public Symposium," July 1990.

Dated: February 26, 1991.

**Lajuana S. Wilcher,**

*Assistant Administrator, Office of Water, U.S. Environmental Protection Agency.*

Dated: February 25, 1991.

**Charles E. Cole,**

*Attorney General, State of Alaska.*

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Friday  
March 1, 1991

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Part VII

## Environmental Protection Agency

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Prince William Sound and Gulf of Alaska;  
Draft 1991 Restoration Work Plan; Notice



## ENVIRONMENTAL PROTECTION AGENCY

[WH-FRL-3910-8]

### Prince William Sound and Gulf of Alaska Restoration

**AGENCY:** Environmental Protection Agency and the Alaska Department of Law.

**ACTION:** Notice.

**SUMMARY:** The Environmental Protection Agency, acting to coordinate restoration on behalf of the Federal Trustees (the U.S. Departments of Interior and Agriculture and the National Oceanic and Atmospheric Administration), and with the Alaska State Trustees (the Alaska Attorney General as the lead State Trustee and the Alaska Departments of Fish and Game and Environmental Conservation) are publishing here (1) a discussion of the overall process the State and Federal governments intend to follow to enhance and expedite the recovery of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska from the *Exxon Valdez* oil spill and (2) a draft 1991 Restoration Work Plan comprised of restoration planning and implementation activities being considered by the Trustees. The public is invited to comment and to suggest other activities that should be considered by the Trustees in preparing this draft 1991 Restoration Work Plan. Notice of intent to take this action was published in the *Federal Register* in November (55 FR 48160, November 19, 1990).

**DATES:** The Federal and State of Alaska governments will accept comments through April 15, 1991.

**ADDRESSES:** Written comments should be submitted to: Secretary, Restoration Planning Work Group, Oil Spill Restoration Planning Office, 437 "E" Street, Suite 301, Anchorage, Alaska 99501, Phone (907) 271-2461.

**FOR FURTHER INFORMATION CONTACT:** Susan MacMullin at (202) 245-4373.

#### SUPPLEMENTARY INFORMATION:

##### I. Introduction

###### Purpose

The U.S. Departments of Agriculture (DOA) and the Interior (DOI), the National Oceanic & Atmospheric Administration (NOAA), and the Alaska Attorney General, the Alaska Departments of Fish and Game and Environmental Conservation, (hereafter referred to as "the Trustees") and the Environmental Protection Agency (EPA) desire to implement restoration

activities in the areas affected by the *Exxon Valdez* oil spill as soon as practicable. This Notice contains a draft 1991 Restoration Work Plan comprised of restoration planning and initial implementation activities under consideration by the Trustee Council, an Alaska-based intergovernmental group charged by the Trustees with managing the natural resources damage assessment and restoration program for 1991. Restoration activities in 1991 and subsequent years will be undertaken as appropriate, based on the Trustees' increasing understanding of resource injuries and other relevant considerations. Implementation activities in 1991 will not foreclose future restoration options and are not intended to be a complete or comprehensive restoration program. Implementation of all restoration activities will follow appropriate procedures for compliance with applicable State and Federal laws and regulations. The President of the United States has designated EPA to coordinate, on behalf of the Federal Trustees, the long-term restoration of Prince William Sound and other areas affected by the *Exxon Valdez* oil spill. Accordingly, the EPA Administrator is issuing this document as an action under the Clean Water Act and the Alaska Attorney General is working in concert with the EPA under State authority.

Although preparation of the draft 1991 Restoration Work Plan is not required under the Clean Water Act or the laws of Alaska, the Trustees and EPA have chosen to present this document to obtain public comment and to invite suggestions about other restoration activities that should be considered by the State and Federal governments. The public is also invited to comment on the overall process the governments intend to follow in enhancing environmental recovery in Prince William Sound, lower Cook Inlet, and the Gulf of Alaska and achieving restoration of affected resources and services after the *Exxon Valdez* oil spill.

The Trustees expect to complete the assessment of damages, determine liability, and collect funds from the responsible parties before they prepare a final Restoration Plan. Although the Trustees wish to resolve damage assessment and liability issues as promptly as possible, it is not possible to predict when this will occur. Considering this uncertainty, in cases where the nature of the resource injury, loss or destruction [hereinafter referred to as "injury"] is reasonably clear, and where no alternatives would be foreclosed, it may be desirable to begin implementation of certain restoration

activities prior to a final Restoration Plan. As a result, the Trustees are considering implementation in 1991 of activities described in section III of this notice. Other activities related to restoration, such as feasibility studies, technical support projects, and monitoring (see sections 2 and 3), will be considered in the following months and will be presented to the public for review and comment. The Trustees also expect to publish a revised 1991 Restoration Work Plan in the *Federal Register* in Spring 1991. The Trustees also expect subsequently to publish notice of and to solicit public comment on detailed descriptions for each of the restoration projects selected for implementation in 1991.

##### Organization of this Notice

This notice has three main sections: I. Introduction, II. Restoration Planning, and III. Draft 1991 Restoration Work Plan. The Introduction presents a synopsis of the purpose of this notice and background information. Section II, Restoration Planning, describes the overall approach to restoration and reports on the planning activities conducted in 1990. In Section III, this notice provides information on restoration planning and initial implementation actions under consideration for 1991.

##### Further Information

Further information about the *Exxon Valdez* oil spill, the damage assessment studies, and restoration planning activities is contained in the documents referenced at the end of this notice and in the *Federal Register* published on November 19, 1990 (55 FR 48160). These documents and other information on restoration and damage assessment are available from the Oil Spill Public Information Center, 645 G Street, Anchorage, Alaska 99501.

## II. Restoration Planning

### A. The Planning Process

The Trustees' and EPA's restoration planning activities are designed to determine appropriate ways to restore natural resources and services injured by the *Exxon Valdez* oil spill. Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the environment to its baseline condition.

The Natural Resource Damage Assessment (NRDA) regulations [43 CFR part 11], which implement certain provisions of CERCLA and CWA, define "restoration" or "rehabilitation" as " \* \* \* actions undertaken [in addition

to response actions), to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided \* \* \*. This definition of restoration from the NRDA regulations is provided here for informational purposes. The NRDA regulations are not mandatory but do provide a model for restoration planning.

The Trustees have determined that restoration after the *Exxon Valdez* oil spill should be subject to continuing review as information is developed about injuries and possible restoration opportunities. The Trustees expect that each year's work will build on the last, and that all information pertinent to the *Exxon Valdez* oil spill will be examined in the course of the restoration process.

#### 1. Steps in the Planning Process

The restoration planning process is a dynamic and evolving process that will generally include the following steps:

##### a. Determining the Need for Restoration.

The need for restoration depends on the nature and extent of natural resources injured, lost, or destroyed and the adequacy of natural recovery. The primary information sources regarding resource injury, loss, or destruction are the studies conducted by State and Federal agencies as part of the natural resources damage assessment. These studies are described in the 1989 and 1990 *Exxon Valdez* damage assessment plans (see the documents referenced at the end of this notice). Other sources of information include public comments, data gathered as part of the oil spill response, and other studies conducted by government agencies outside of the damage assessment process.

**b. Identifying Potential Restoration Activities.** For any injury, there are three possible types of restoration which may be used singularly or in any combination:

*Direct restoration* refers to measures in addition to response actions, usually taken on site, to directly restore or rehabilitate an injured, lost, or destroyed resource or otherwise to promote or enhance the recovery of such resources;

*Replacement* refers to substituting one resource for an injured, lost, or destroyed resource of the same or similar type; and

*Acquisition of equivalent resources* means to compensate for an injured, lost, or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource.

Determining the adequacy of natural recovery is fundamental to the choice of a restoration activity. In some cases the Trustees may determine that it is most appropriate to allow natural recovery to proceed without further intervention by man (i.e., no action alternative). The definition of direct restoration includes any administrative actions that may be taken by the Federal or State agencies, such as limiting certain activities in the affected areas, to promote recovery of injured resources.

**c. Evaluating Potential Restoration Alternatives.** Evaluation of potential restoration alternatives will consider such factors as:

- Nature and extent of injury;
- Adequacy of natural recovery;
- Technical feasibility;
- Net environmental benefit (including indirect impacts);
- Cost effectiveness;
- Reasonableness of cost of the restoration project in light of the value or ecological significance of the resource; and
- Results of actual or planned response actions.

Some restoration proposals may be readily evaluated. In other cases additional information, for example, biological, ecological, or resource assessment data, will be gathered to support the evaluation process. The goal of the Trustees and EPA is to conduct restoration planning for the recovery of the injured environment as a whole. In general, priority will be given to alternatives which benefit multiple rather than single species or resources. By necessity, however, individual elements of the restoration program may be species- or resource-specific.

**d. Recommending and Implementing Restoration Activities on a Continuing Basis.** As information about injuries, resources recovery, restoration methods or costs becomes available, certain activities may be recommended and carried out in advance of the receipt of funds for restoration from the parties responsible for the oil spill (see Section III, below).

**e. Presenting a Damage Claim to Parties Responsible for the Oil Spill and Receiving Funds for Restoration.** The damage assessment process initiated by the Trustees is designed to identify and quantify specific resource injuries and determine restoration costs and other corresponding monetary values. The Federal and State governments will present their claims for these amounts to the parties responsible for the oil spill as required by Federal and State law.

**f. Preparing and Implementing a Final Restoration Plan.** When the full amount

of restoration funds that will be recovered has been resolved, final determinations will be made concerning the nature and scope of the remaining phases of restoration.

##### g. Evaluating the Effectiveness of Restoration Measures, and Recommending Additional Actions.

Implementation of restoration activities and the success of resource recovery will be monitored and evaluated based on standards appropriate to individual projects and resources to verify that restoration goals have been met. Long-term monitoring activities also may be implemented to verify that the affected area is recovering.

Restoration planning, as outlined above, is underway; the overall pace of restoration is dependent on the availability of information to determine injury and the resolution of a claim for damages. Implementation of restoration and monitoring activities may take a number of years. The Trustees and EPA intend to follow the restoration planning process as outlined above in order to accelerate the restoration of the Prince William Sound-Gulf of Alaska ecosystem and the affected natural resources and services.

#### 2. Public Participation

The Trustees and EPA intend to encourage, provide for, and be responsive to public participation and review during the restoration planning process. Carrying out this intent, however, is complicated by the need for confidentiality with respect to damage assessment information due to pending or possible future litigation with the parties responsible for the *Exxon Valdez* oil spill. Notwithstanding these considerations, the Trustees intend to provide an opportunity for meaningful public review and comment on all restoration implementation activities.

In September of 1990, the Oil Spill Public Information Center was opened in Anchorage to provide the public with scientific data and other information related to the 1989 *Exxon Valdez* oil spill. The Trustees will continue to place information in the center as it becomes available.

#### 3. Restoration Planning Activities in 1990

The Trustees and EPA began to solicit public opinion in March 1990 with a symposium on restoration in Anchorage, Alaska. In April and May of 1990, eight public scoping meetings were held throughout southcentral Alaska to ascertain the public's priorities for the restoration program. For a detailed description of these meetings, see the

documents referenced at the end of this notice. In addition to these public meetings, the governments have communicated individually with such constituencies as Native corporations and villages, fishing groups, and environmental organizations.

To gather specific scientific input for the restoration planning process, technical workshops were held in Anchorage in April 1990. Follow-up meetings were held in October and November 1990. Participants included members of the Restoration Planning Work Group (the Alaska Departments of Fish and Game, Environmental Conservation, and Natural Resources, and the U.S. Departments of Interior and Agriculture, the National Oceanic and Atmospheric Administration, and the U.S. Environmental Protection Agency) Federal and State resource managers, and scientists and technical experts under contract to the governments. Due to the necessary discussion of litigation-sensitive damage assessment information, these workshops were closed to the general public.

The Restoration Planning Work Group completed a preliminary literature search, which identified articles and other published material concerning techniques for ecological restoration following oil spills. Approximately 200 publications were acquired for detailed review and are listed in the August 1990 Progress Report.

The Trustees and EPA initiated several small-scale field studies to evaluate the feasibility of restoration techniques. Results from these studies will help determine the costs and effectiveness of full-scale restoration projects. Several technical support studies were also initiated to provide information needed to evaluate or carry out some potential restoration activities. These studies are described in the "State/Federal Natural Resources Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill," August 1990. The 1990 studies and preliminary results are summarized below.

#### B. 1990 Restoration Feasibility Studies

##### 1. Reestablishment of *Fucus* in Rocky Intertidal Ecosystems

Agencies: U.S. Environmental Protection Agency, U.S. Forest Service.

Early observations indicated that *Fucus*, a marine plant (rockweed) found on rocky shorelines in the intertidal zone throughout the oil spill area, was extensively damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* could be significantly accelerated or enhanced it would

benefit the recovery of associated flora and fauna on intertidal rocky shores.

Specific objectives of this study were to identify the causes of variation in *Fucus* recovery at and near Herring Bay, Knight Island in Prince William Sound; to document the effects of alternative cleaning methods on *Fucus*; and to test the feasibility of enhancing the reestablishment of *Fucus*. Although results are preliminary at this time, it appears that *Fucus* recovers most slowly at the sites that were intensively cleaned and that almost no recovery occurs where tar cover persists.

##### 2. Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems

Agencies: U.S. Forest Service, U.S. Environmental Protection Agency.

This feasibility study was designed to compare the rates of faunal recovery in rocky intertidal communities, and to demonstrate the feasibility of restoration of these communities by enhancing recolonization rates for such key species as limpets and starfish. Recolonization rates for these organisms and for the rockweed, *Fucus*, may limit the natural rates of recovery for the entire community.

Parameters examined included the presence or absence of common intertidal species on impacted and reference sites, population dynamics of several species of invertebrates, larval settlement on oiled versus non-oiled surfaces, and differences in algal grazing by limpets between oiled and referenced sites. Preliminary results indicate that heavy predation of several species of transplanted invertebrates was probably due to the lack of cover usually provided by *Fucus*.

##### 3. Identification of Potential Sites for Stabilization and Restoration With Beach Wildrye

Lead Agency: Alaska Department of Natural Resources, United States Forest Service.

This study was designed to identify sites at which damage to beach wildrye grass has occurred and to recommend restoration measures. This species was affected by both spilled oil and subsequent cleanup activities. Beach wildrye grass is important in the prevention of erosion in the coastal environment and is a key component of supratidal habitats in locations throughout the oil spill area. Erosion resulting from loss of beach wildrye can lead to the destabilization and degradation of wildlife habitats and of cultural and recreational sites. Survey work in 1990 in Prince William Sound indicated injury to several beach rye communities. Following confirmation in the 1991 spring shoreline assessment,

restoration activities can be initiated (see Restoration Project 1 summary).

##### 4. Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill

Agencies: U.S. Fish and Wildlife Service, Alaska Department of Fish and Game.

A diversity of birds, mammals, and other animals were killed by the spill or injured by contamination of prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for activities such as feeding and resting, but many also use upland habitats. Protection of upland habitats from further degradation may reduce cumulative effects on injured fish and wildlife populations, and thereby help them recover from the effects of the oil spill. This study focused specifically on marbled murrelets and harlequin ducks, two species known to have been affected by the spill and known to use upland habitats.

Based on surveys of 140 streams, preliminary results of the harlequin duck study indicate that this species nests along larger-than-average anadromous fish streams, with moderate gradients and clear waters. Preliminary results on murrelets suggest that murrelets use slopes facing north or west, and inland areas at the heads of bays as opposed to the outer peninsulas. Open bog meadows, especially at the heads of bays, appear to be used as flight corridors to upper wooded areas.

##### 5. Land Status, Uses, and Management Plans in Relation to Natural Resources and Services

Agencies: Alaska Department of Natural Resources, U.S. Forest Service, U.S. National Park Service, Alaska Department of Fish and Game.

The objective of this study is to locate, categorize, evaluate, and determine the availability of maps, management plans, and other resource documents relevant to restoration planning throughout the oil-spill region. Resource materials identified will assist in planning for and implementing site-specific restoration activities, including direct restoration, replacement, and the acquisition of equivalent resources.

To date, a variety of documents, maps, and management plans have been identified and are being evaluated; other resource materials are being located. This preliminary project will be completed in Spring 1991. A second phase, directly supporting the proposed Restoration Project Number 4, Protection of Strategic Fish and Wildlife

Habitats and Recreation Sites, is under consideration.

### C. 1990 Technical Support Projects

#### 1. Peer Reviewer Process for Restoration Feasibility Studies

Agencies: Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency.

This project provided funds to ensure that scientists with expertise on natural resource restoration were available to provide peer review of restoration feasibility projects and other restoration planning studies and activities.

#### 2. Assessment of Beach Segment Survey Data

Agencies: Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, U.S. Forest Service, U.S. Park Service, U.S. Environmental Protection Agency.

The objective of this project is to review and summarize beach survey information (obtained through oil spill response activities) to assist in planning for and implementing site-specific restoration activities, particularly in the area of direct restoration. This study was initiated late in 1990 and continues to date.

A master database is being created from that portion of the beach surveys relevant to restoration. The primary sources of this information are the Alaska Departments of Natural Resources and Environmental Conservation. Data from local and regional governments as well as non-governmental sources will also be reviewed and integrated into the system as appropriate. This preliminary project will be completed in Spring 1991.

3. Development of Potential Feasibility Studies for 1991 Agencies: Alaska Department of Fish and Game, U.S. Environmental Protection Agency, Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, U.S. Forest Service, U.S. Department of Fish and Game, U.S. National Park Service, U.S. National Oceanic and Atmospheric Administration.

This project provided for the orderly development of additional feasibility studies including: (a) Monitoring "natural" recoveries; (b) pink salmon stock identification; (c) herring stock identification/spawning site inventory;

(d) artificial reefs for fish and shellfish; (e) alternative recreation sites and facilities; (f) historic sites and artifacts; and (g) availability of forage fish.

Currently feasibility study proposals are under consideration for all of the above themes.

### III. 1991 Restoration Work Plan

The Trustees are currently developing and evaluating restoration planning and implementation activities, which will be described in the 1991 Restoration Work Plan to be published in the *Federal Register* later in the Spring. Planning activities will include feasibility studies, technical support studies, and natural recovery monitoring which will be made available to the public for review and comment. Implementation activities that are now under consideration are presented in this section. The Trustees and EPA are asking, through this notice, for public comment on and additional suggestions for restoration planning and implementation activities for 1991. As noted previously, the Trustees and EPA anticipate publishing later this Spring a notice of the restoration projects identified for implementation in 1991. More detailed descriptions for 1991 restoration projects will be made available to the public for comment.

#### A. 1991 Restoration Planning Activities

The fundamental purpose of restoration planning is to identify and evaluate potential restoration implementation activities, in consultation with technical experts and the public. The integration of results from the damage assessment and other information into restoration planning is critical to the success of the oil spill program. As damage assessment results are reviewed and evaluated, the Trustees will identify potential restoration implementation activities and related feasibility and technical support projects. This process involves ongoing consultation with principal investigators for damage assessment studies, agency experts, and outside peer reviewers to review the nature and extent of oil spill injuries in relation to the biology and ecology of injured species, habitats, and ecosystems. A key goal is to identify life history requirements, limiting factors, and environmental processes that are especially sensitive or that may be enhanced.

Section II describes five feasibility studies carried out in 1990, some of which may continue in 1991. The Trustees and EPA are considering additional feasibility and technical support projects in 1991 and, following additional review, intend to discuss

them in the Spring 1991 *Federal Register* Notice. Studies now being considered concern a variety of resources, including pink salmon, tidal marshes, Pacific herring, bald eagles, recreation, and sea otters. Feasibility and technical support studies will be implemented as damage assessment data and funding become available.

The scientific literature and experience from oil spills other than the *Exxon Valdez* will provide background on restoration and information from other oil spills. In 1991, the Restoration Planning Work Group expects to review and evaluate previously identified literature on restoration (see Appendix B, August 1990 Progress Report) and to continue review and evaluation of literature on species and ecosystem recoveries following anthropogenic and natural environmental disturbances.

Information on the adequacy of natural recovery is central to determining whether to implement restoration actions or to allow injured resources to recover on their own. Direct measures of recovery, such as species distribution, abundance, diversity, growth, reproductive success, or other physiological and biochemical properties, may be appropriate monitoring objectives. In some cases, it is appropriate to indirectly determine the degree of recovery by measuring exposure (presence of oil residuals and/or metabolites) and by applying knowledge or toxicological effects derived from the oil spill literature. For these reasons, the recovery of injured resources can best be followed by implementing a balanced program of monitoring. The duration of recovery monitoring will depend on the time necessary to establish a trend for recovery, and this in turn will necessarily depend on the severity and duration of effects resulting from the oil spill.

Some recovery monitoring studies will be considered for implementation in 1991. As with feasibility and technical support projects, these will be discussed in the March 1991 *Federal Register* document.

Public participation will continue to be an important component of restoration planning in 1991. The Restoration Planning Work Group is interested in and will try to accommodate requests for meetings with individuals or groups. In addition, the Trustees will consider whether and what additional actions, such as publications and workshops, are appropriate and possible in 1991. Requests and suggestions from the public are invited.

### B. 1991 Restoration Implementation Activities

Where the nature of the resource injury is reasonably clear, it may be desirable to begin restoration prior to receipt of funds from the parties responsible for the oil spill. There are several reasons why this may be so.

Failure to undertake timely restoration may allow damages initiated by the spill to continue or accelerate, as in the case of the loss of stabilizing vegetation on beaches. In other cases, protection of strategic habitats, subject to land-use changes, can reduce cumulative stresses on injured resources and maintain, in the near term, a full range of restoration options. Finally, the importance of a resource for subsistence, commercial, or recreational purposes may justify prompt restoration action.

The restoration activities being considered by the Trustees for implementation in 1991 are described below. Before making final decisions for the 1991 program, the Trustees are prepared to conduct public meetings in some of the oil spill communities, if requested to do so. Moreover, the Trustees expect to provide further opportunity for public comment on the 1991 restoration projects after detailed descriptions for each project are available. The projects now under consideration for the initial phase of the restoration process are:

#### 1. Restoration of the Beach Wildrye Community

Lead Agencies: Alaska Department of Environmental Conservation, U.S. Forest Service

##### Need and Objectives:

The high intertidal-supratidal beach wildrye grasses (*Elymus arenarius* and *E. mollis*) communities show signs of localized injury as a result of the Exxon Valdez oil spill and the associated cleanup activities. Injury appears to have resulted from oiling and the stress of mechanical abrasion resulting from oil removal operations carried out by cleanup workers and equipment. Beach wildrye grasses are major contributors to natural beach stability. Injury to this important plant community may result in accelerated erosion of the beaches and adjacent upland plant communities. Also at risk from increased erosion are several nearshore archaeological sites.

Once the beach wildrye root masses are disturbed, natural recovery may be slow, taking several years. Wildrye recolonizes primarily by spreading outward from undamaged plants, and this process can be stopped altogether if the rate of erosion is too great. This may result in a significant loss of intertidal

and supratidal area. Restoration intervention may often stabilize a beach in one growing season.

The objective of this project is to stabilize injured sites where natural or cultural resources are at risk. Specific sites for restoration will be chosen following the 1991 Spring Shoreline Assessment. The Department of Environmental Conservation and the Forest Service are also exploring whether this project may more appropriately be carried out under the State/Federal response program.

##### Methods:

Replanting beach wildrye for stabilization is a proven technology. Nearby healthy stocks of beach wildrye grass will be used as a source of donor material. After replanting, fertilizer will be applied (20-20-10 fertilizer up to 800 pounds per acre) to help the transplanted beach wildrye grass recolonize. At some locations fertilizer alone may be sufficient to encourage existing injured plant communities to recover without transplanting new stock.

Estimated 1991 Cost: \$180,000

#### 2. Public Information and Education for Recovery and Protection of Alaska's Marine and Coastal Resources

Lead Agencies: U.S. Fish and Wildlife Service, U.S. National Park Service, Alaska, Department of Environmental Conservation

##### Need and Objectives:

The Exxon Valdez oil spill caused direct and indirect injury to the marine birds and mammals of southcentral Alaska. The purpose of this project is to make users of the area aware of the changes to the ecosystem resulting from the oil spill and to lessen the potential for additional harmful human disturbances.

##### Methods:

The project's sponsors will publish and distribute information explaining the potential adverse impacts of human activities, and the importance of increased conservation and protection of marine birds and mammals in key habitats in the oil spill area. Print media such as posters, brochures, and possibly books and video tapes will be produced. Consideration will also be given to production of material for school curricula.

Print media will be distributed through traditional outlets including but not limited to refuge, park, and tourist information and visitor centers. Additional distribution will occur at airports, boat harbors, commercial tour operators, and to public agency and private industry training staffs.

Some species identification information will be included but the primary content of the media will emphasize strategies to allow public use and enjoyment of marine birds and mammals while preventing harmful disturbances to these species. Estimated 1991 Cost: \$100,000

#### 3. Salmonid Stocks and Habitat Restoration

Lead Agencies: Alaska Department of Fish and Game, U.S. Forest Service

##### Need and Objectives:

Spawning and nursery areas of wild stocks of pink and chum salmon which were impacted by the Exxon Valdez oil spill occur throughout Prince William Sound, lower Cook Inlet, and the Gulf of Alaska. Pink and chum salmon are major components of the ecosystem, serving as important food sources for other fish, birds, terrestrial and marine mammals. Pink and chum salmon are also harvested by man in subsistence, commercial, and sport fisheries. Since salmon return to the individual streams in which they were born, with little straying to other streams, genetically unique wild salmon stocks will be restored through site specific rehabilitation of salmon spawning and rearing habitats.

##### Methods:

This project consists of several proven fisheries enhancement techniques that may be applied immediately at specific sites. In addition to those sites and streams at which potential rehabilitation activities already have been identified, a survey of affected salmon spawning habitat within the oil spill area will be conducted in 1991 to determine additional restoration measures. The proposed techniques include fish passage through stream channelization or fish ladders to overcome physical and hydrological barriers and construction of spawning channels. All of these measures provide oil-free spawning areas to replace oil-impacted spawning areas. Additional wild salmon stock restoration measures include remote egg-taking and incubation at existing hatcheries for ultimate fry release in oil-impacted streams. Other measures may include optimal fry release programs that will enhance marine survival of juvenile salmonids.

Estimated 1991 Cost: \$1,300,000

#### 4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead Agencies: Alaska Department of Fish and Game, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture

**Need and Objectives:**

The marine and intertidal habitats where most oil spill injuries occurred are ecologically linked to adjacent uplands. The water quality in streams and estuaries where salmon spawn depends on the adjacent uplands. Eagles nest and roost in large trees along the coasts and streams, and marbled murrelets nest in association with forested uplands. Harlequin ducks nest in riparian habitats and feed in the streams as well as in nearby intertidal and estuarine areas. Common and thick-billed murres and other seabirds nest on off-shore islands.

Tourism and recreation activities, such as sport fishing and camping, also depend on the quality and accessibility of shorelines and uplands. The diversity, productivity, and uses of intertidal and estuarine habitats, and of freshwater streams along the coast depend on the ecological integrity of the adjacent uplands. Continued productivity in the undamaged parts of the regional ecosystem, including strategic marine, intertidal, and estuarine habitats and adjacent uplands, may be necessary for the recovery of biological communities that were injured.

During the public scoping process the governments received many restoration suggestions that involved the protection and prime fish and wildlife habitats, recreation sites, and adjacent uplands. Suggested approaches to this protection included land acquisition and changes in management practices.

Land-use activities may occur in the oil spill area in 1991 or 1992. These activities may impact important habitats and recreation sites or slow the recovery of spill-injured resources.

The objective of this project is to identify and protect strategic wildlife and fisheries habitats and recreation sites and to prevent further potential environmental damages to resources injured by the *Exxon Valdez* oil spill. This project will be preceded by a technical support project to identify and evaluate potential properties which if publicly owned will contribute to this objective. Where acquisition of property

rights is determined to be appropriate, they will be acquired on a willing buyer/willing seller basis. Primary considerations in deciding which properties should be acquired during this project will include (1) the nature and immediacy of changes in use that may further affect resources injured by the oil spill and (2) the prospect that failure to act will foreclose restoration opportunities.

The Trustees have developed the following preliminary sequence of steps for use in identifying and protecting strategic fish and wildlife habitats and recreation sites:

1. Identification of key upland habitats that are linked to the recovery of injured resources or services by scientific data or other relevant information.

2. Characterization and evaluation of potential impacts from changed land use in relation to their effects on recovery of the ecosystem and its components; comparative evaluation of recovery strategies not involving acquisition of property rights (e.g., redesignation of land use classification), including an assessment of protection afforded by existing law, regulations, and other alternatives.

3. Evaluation of cost-effective strategies to achieve restoration objectives for key upland habitats, identified through steps one and two above. This would include evaluation of other restoration alternatives for these resource injuries.

4. Willing seller/buyer negotiations with private landowners for property rights.

5. Incorporation of acquired property rights into public management.

Habitat and recreation site acquisition proposals that meet the appropriate evaluation factors for restoration (see section 2) will be identified and assigned by priority for implementation in accordance with this preliminary five-step process and applicable State and Federal laws and regulations.

The geographic scope of the 1991 project will be the oil spill area. Subsequent to this initial effort, the

Trustees will continue to survey potential acquisitions, including acquisitions outside the spill area. Estimated Cost: To be determined

**C. Funding for the 1991 Restoration Work Plan**

Although it is expected that the responsible parties will pay for the costs of the damage assessment and restoration program, there is no certainty about the final amount and when such funds will be forthcoming. It is possible, therefore, that funds to carry out the 1991 Restoration Work Plan, including the proposed planning and implementation activities, will have to be advanced by the State and Federal governments. To date, those funds have not been committed or secured by either government.

**D. References**

The documents listed below provide additional information on damage assessment and restoration. They are available from the Oil Spill Public Information Center, The Simpson Building, 645 G Street, Anchorage, Alaska, 99501.

1. "The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plan for the *Exxon Valdez* Oil Spill, Volume I Assessment and Restoration Plan Appendices A, B, C."
2. "State/Federal Natural Resource Damage Assessment Plan for the *Exxon Valdez* Oil Spill," August 1989.
3. "Restoration Planning following the *Exxon Valdez* Oil Spill: August 1990 Progress Report."
4. "Restoration following the *Exxon Valdez* Oil Spill: Proceedings of the Public Symposium," July 1990.

Dated: February 26, 1991.

**Lajuana S. Wilcher,**  
Assistant Administrator, Office of Water, U.S.  
Environmental Protection Agency.

Dated: February 25, 1991.

**Charles E. Cole,**  
Attorney General, State of Alaska.  
[FR Doc. 91-5014 Filed 2-28-91; 8:45 am]  
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# **federal register**

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**Friday  
March 1, 1991**

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**Part VII**

## **Environmental Protection Agency**

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**Prince William Sound and Gulf of Alaska;  
Draft 1991 Restoration Work Plan; Notice**

**ENVIRONMENTAL PROTECTION  
AGENCY**

(WH-FRL-3910-8)

**Prince William Sound and Gulf of  
Alaska Restoration**
**AGENCY:** Environmental Protection Agency and the Alaska Department of Law.

**ACTION:** Notice.

**SUMMARY:** The Environmental Protection Agency, acting to coordinate restoration on behalf of the Federal Trustees (the U.S. Departments of Interior and Agriculture and the National Oceanic and Atmospheric Administration), and with the Alaska State Trustees (the Alaska Attorney General as the lead State Trustee and the Alaska Departments of Fish and Game and Environmental Conservation) are publishing here (1) a discussion of the overall process the State and Federal governments intend to follow to enhance and expedite the recovery of Prince William Sound, lower Cook Inlet, and the Gulf of Alaska from the *Exxon Valdez* oil spill and (2) a draft 1991 Restoration Work Plan comprised of restoration planning and implementation activities being considered by the Trustees. The public is invited to comment and to suggest other activities that should be considered by the Trustees in preparing this draft 1991 Restoration Work Plan. Notice of intent to take this action was published in the *Federal Register* in November (55 FR 48160, November 19, 1990).

**DATES:** The Federal and State of Alaska governments will accept comments through April 15, 1991.

**ADDRESSES:** Written comments should be submitted to: Secretary, Restoration Planning Work Group, Oil Spill Restoration Planning Office, 437 "E" Street, Suite 301, Anchorage, Alaska 99501, Phone (907) 271-2461.

**FOR FURTHER INFORMATION CONTACT:** Susan MacMullin at (202) 245-4373.

**SUPPLEMENTARY INFORMATION:**
**I. Introduction**
*Purpose*

The U.S. Departments of Agriculture (DOA) and the Interior (DOI), the National Oceanic & Atmospheric Administration (NOAA), and the Alaska Attorney General, the Alaska Departments of Fish and Game and Environmental Conservation, (hereafter referred to as "the Trustees") and the Environmental Protection Agency (EPA) desire to implement restoration

activities in the areas affected by the *Exxon Valdez* oil spill as soon as practicable. This Notice contains a draft 1991 Restoration Work Plan comprised of restoration planning and initial implementation activities under consideration by the Trustee Council, an Alaska-based intergovernmental group charged by the Trustees with managing the natural resources damage assessment and restoration program for 1991. Restoration activities in 1991 and subsequent years will be undertaken as appropriate, based on the Trustees' increasing understanding of resource injuries and other relevant considerations. Implementation activities in 1991 will not foreclose future restoration options and are not intended to be a complete or comprehensive restoration program. Implementation of all restoration activities will follow appropriate procedures for compliance with applicable State and Federal laws and regulations. The President of the United States has designated EPA to coordinate, on behalf of the Federal Trustees, the long-term restoration of Prince William Sound and other areas affected by the *Exxon Valdez* oil spill. Accordingly, the EPA Administrator is issuing this document as an action under the Clean Water Act and the Alaska Attorney General is working in concert with the EPA under State authority.

Although preparation of the draft 1991 Restoration Work Plan is not required under the Clean Water Act or the laws of Alaska, the Trustees and EPA have chosen to present this document to obtain public comment and to invite suggestions about other restoration activities that should be considered by the State and Federal governments. The public is also invited to comment on the overall process the governments intend to follow in enhancing environmental recovery in Prince William Sound, lower Cook Inlet, and the Gulf of Alaska and achieving restoration of affected resources and services after the *Exxon Valdez* oil spill.

The Trustees expect to complete the assessment of damages, determine liability, and collect funds from the responsible parties before they prepare a final Restoration Plan. Although the Trustees wish to resolve damage assessment and liability issues as promptly as possible, it is not possible to predict when this will occur. Considering this uncertainty, in cases where the nature of the resource injury, loss or destruction [hereinafter referred to as "injury"] is reasonably clear, and where no alternatives would be foreclosed, it may be desirable to begin implementation of certain restoration

activities prior to a final Restoration Plan. As a result, the Trustees are considering implementation in 1991 of activities described in section III of this notice. Other activities related to restoration, such as feasibility studies, technical support projects, and monitoring (see sections 2 and 3), will be considered in the following months and will be presented to the public for review and comment. The Trustees also expect to publish a revised 1991 Restoration Work Plan in the *Federal Register* in Spring 1991. The Trustees also expect subsequently to publish notice of and to solicit public comment on detailed descriptions for each of the restoration projects selected for implementation in 1991.

*Organization of this Notice*

This notice has three main sections: I. Introduction, II. Restoration Planning, and III. Draft 1991 Restoration Work Plan. The Introduction presents a synopsis of the purpose of this notice and background information. Section II, Restoration Planning, describes the overall approach to restoration and reports on the planning activities conducted in 1990. In Section III, this notice provides information on restoration planning and initial implementation actions under consideration for 1991.

*Further Information*

Further information about the *Exxon Valdez* oil spill, the damage assessment studies, and restoration planning activities is contained in the documents referenced at the end of this notice and in the *Federal Register* published on November 19, 1990 (55 FR 48160). These documents and other information on restoration and damage assessment are available from the Oil Spill Public Information Center, 645 G Street, Anchorage, Alaska 99501.

**II. Restoration Planning**
**A. The Planning Process**

The Trustees' and EPA's restoration planning activities are designed to determine appropriate ways to restore natural resources and services injured by the *Exxon Valdez* oil spill. Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the environment to its baseline condition.

The Natural Resource Damage Assessment (NRDA) regulations [43 CFR part 11], which implement certain provisions of CERCLA and CWA, define "restoration" or "rehabilitation" as " \* \* \* actions undertaken [in addition

to response actions], to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided \* \* \*. This definition of restoration from the NRDA regulations is provided here for informational purposes. The NRDA regulations are not mandatory but do provide a model for restoration planning.

The Trustees have determined that restoration after the *Exxon Valdez* oil spill should be subject to continuing review as information is developed about injuries and possible restoration opportunities. The Trustees expect that each year's work will build on the last, and that all information pertinent to the *Exxon Valdez* oil spill will be examined in the course of the restoration process.

#### 1. Steps in the Planning Process

The restoration planning process is a dynamic and evolving process that will generally include the following steps:

*a. Determining the Need for Restoration.* The need for restoration depends on the nature and extent of natural resources injured, lost, or destroyed and the adequacy of natural recovery. The primary information sources regarding resource injury, loss, or destruction are the studies conducted by State and Federal agencies as part of the natural resources damage assessment. These studies are described in the 1989 and 1990 *Exxon Valdez* damage assessment plans (see the documents referenced at the end of this notice). Other sources of information include public comments, data gathered as part of the oil spill response, and other studies conducted by government agencies outside of the damage assessment process.

*b. Identifying Potential Restoration Activities.* For any injury, there are three possible types of restoration which may be used singularly or in any combination:

*Direct restoration* refers to measures in addition to response actions, usually taken on site, to directly restore or rehabilitate an injured, lost, or destroyed resource or otherwise to promote or enhance the recovery of such resources;

*Replacement* refers to substituting one resource for an injured, lost, or destroyed resource of the same or similar type; and

*Acquisition of equivalent resources* means to compensate for an injured, lost, or destroyed resource by substituting another resource that provides the same or substantially similar services as the injured resource.

Determining the adequacy of natural recovery is fundamental to the choice of a restoration activity. In some cases the Trustees may determine that it is most appropriate to allow natural recovery to proceed without further intervention by man (i.e., no action alternative). The definition of direct restoration includes any administrative actions that may be taken by the Federal or State agencies, such as limiting certain activities in the affected areas, to promote recovery of injured resources.

*c. Evaluating Potential Restoration Alternatives.* Evaluation of potential restoration alternatives will consider such factors as:

- Nature and extent of injury;
- Adequacy of natural recovery;
- Technical feasibility;
- Net environmental benefit (including indirect impacts);
- Cost effectiveness;
- Reasonableness of cost of the restoration project in light of the value or ecological significance of the resource; and
- Results of actual or planned response actions.

Some restoration proposals may be readily evaluated. In other cases additional information, for example, biological, ecological, or resource assessment data, will be gathered to support the evaluation process. The goal of the Trustees and EPA is to conduct restoration planning for the recovery of the injured environment as a whole. In general, priority will be given to alternatives which benefit multiple rather than single species or resources. By necessity, however, individual elements of the restoration program may be species- or resource-specific.

*d. Recommending and Implementing Restoration Activities on a Continuing Basis.* As information about injuries, resources recovery, restoration methods or costs becomes available, certain activities may be recommended and carried out in advance of the receipt of funds for restoration from the parties responsible for the oil spill (see Section III, below).

*e. Presenting a Damage Claim to Parties Responsible for the Oil Spill and Receiving Funds for Restoration.* The damage assessment process initiated by the Trustees is designed to identify and quantify specific resource injuries and determine restoration costs and other corresponding monetary values. The Federal and State governments will present their claims for these amounts to the parties responsible for the oil spill as required by Federal and State law.

*f. Preparing and Implementing a Final Restoration Plan.* When the full amount

of restoration funds that will be recovered has been resolved, final determinations will be made concerning the nature and scope of the remaining phases of restoration.

#### *g. Evaluating the Effectiveness of Restoration Measures, and Recommending Additional Actions.*

Implementation of restoration activities and the success of resource recovery will be monitored and evaluated based on standards appropriate to individual projects and resources to verify that restoration goals have been met. Long-term monitoring activities also may be implemented to verify that the affected area is recovering.

Restoration planning, as outlined above, is underway; the overall pace of restoration is dependent on the availability of information to determine injury and the resolution of a claim for damages. Implementation of restoration and monitoring activities may take a number of years. The Trustees and EPA intend to follow the restoration planning process as outlined above in order to accelerate the restoration of the Prince William Sound-Gulf of Alaska ecosystem and the affected natural resources and services.

#### 2. Public Participation

The Trustees and EPA intend to encourage, provide for, and be responsive to public participation and review during the restoration planning process. Carrying out this intent, however, is complicated by the need for confidentiality with respect to damage assessment information due to pending or possible future litigation with the parties responsible for the *Exxon Valdez* oil spill. Notwithstanding these considerations, the Trustees intend to provide an opportunity for meaningful public review and comment on all restoration implementation activities.

In September of 1990, the Oil Spill Public Information Center was opened in Anchorage to provide the public with scientific data and other information related to the 1989 *Exxon Valdez* oil spill. The Trustees will continue to place information in the center as it becomes available.

#### 3. Restoration Planning Activities in 1990

The Trustees and EPA began to solicit public opinion in March 1990 with a symposium on restoration in Anchorage, Alaska. In April and May of 1990, eight public scoping meetings were held throughout southcentral Alaska to ascertain the public's priorities for the restoration program. For a detailed description of these meetings, see the

documents referenced at the end of this notice. In addition to these public meetings, the governments have communicated individually with such constituencies as Native corporations and villages, fishing groups, and environmental organizations.

To gather specific scientific input for the restoration planning process, technical workshops were held in Anchorage in April 1990. Follow-up meetings were held in October and November 1990. Participants included members of the Restoration Planning Work Group (the Alaska Departments of Fish and Game, Environmental Conservation, and Natural Resources, and the U.S. Departments of Interior and Agriculture, the National Oceanic and Atmospheric Administration, and the U.S. Environmental Protection Agency) Federal and State resource managers, and scientists and technical experts under contract to the governments. Due to the necessary discussion of litigation-sensitive damage assessment information, these workshops were closed to the general public.

The Restoration Planning Work Group completed a preliminary literature search, which identified articles and other published material concerning techniques for ecological restoration following oil spills. Approximately 200 publications were acquired for detailed review and are listed in the August 1990 Progress Report.

The Trustees and EPA initiated several small-scale field studies to evaluate the feasibility of restoration techniques. Results from these studies will help determine the costs and effectiveness of full-scale restoration projects. Several technical support studies were also initiated to provide information needed to evaluate or carry out some potential restoration activities. These studies are described in the "State/Federal Natural Resources Damage Assessment and Restoration Plan for the Exxon Valdez Oil Spill," August 1990. The 1990 studies and preliminary results are summarized below.

#### B. 1990 Restoration Feasibility Studies

##### 1. Reestablishment of *Fucus* in Rocky Intertidal Ecosystems

Agencies: U.S. Environmental Protection Agency, U.S. Forest Service.

Early observations indicated that *Fucus*, a marine plant (rockweed) found on rocky shorelines in the intertidal zone throughout the oil spill area, was extensively damaged by both the spilled oil and cleanup efforts. If the natural recovery of *Fucus* could be significantly accelerated or enhanced it would

benefit the recovery of associated flora and fauna on intertidal rocky shores.

Specific objectives of this study were to identify the causes of variation in *Fucus* recovery at and near Herring Bay, Knight Island in Prince William Sound; to document the effects of alternative cleaning methods on *Fucus*; and to test the feasibility of enhancing the reestablishment of *Fucus*. Although results are preliminary at this time, it appears that *Fucus* recovers most slowly at the sites that were intensively cleaned and that almost no recovery occurs where tar cover persists.

##### 2. Reestablishment of Critical Fauna in Rocky Intertidal Ecosystems

Agencies: U.S. Forest Service, U.S. Environmental Protection Agency.

This feasibility study was designed to compare the rates of faunal recovery in rocky intertidal communities, and to demonstrate the feasibility of restoration of these communities by enhancing recolonization rates for such key species as limpets and starfish. Recolonization rates for these organisms and for the rockweed, *Fucus*, may limit the natural rates of recovery for the entire community.

Parameters examined included the presence or absence of common intertidal species on impacted and reference sites, population dynamics of several species of invertebrates, larval settlement on oiled versus non-oiled surfaces, and differences in algal grazing by limpets between oiled and referenced sites. Preliminary results indicate that heavy predation of several species of transplanted invertebrates was probably due to the lack of cover usually provided by *Fucus*.

##### 3. Identification of Potential Sites for Stabilization and Restoration With Beach Wildrye

Lead Agency: Alaska Department of Natural Resources, United States Forest Service.

This study was designed to identify sites at which damage to beach wildrye grass has occurred and to recommend restoration measures. This species was affected by both spilled oil and subsequent cleanup activities. Beach wildrye grass is important in the prevention of erosion in the coastal environment and is a key component of supratidal habitats in locations throughout the oil spill area. Erosion resulting from loss of beach wildrye can lead to the destabilization and degradation of wildlife habitats and of cultural and recreational sites. Survey work in 1990 in Prince William Sound indicated injury to several beach rye communities. Following confirmation in the 1991 spring shoreline assessment,

restoration activities can be initiated (see Restoration Project 1 summary).

##### 4. Identification of Upland Habitats Used by Wildlife Affected by the Oil Spill

Agencies: U.S. Fish and Wildlife Service, Alaska Department of Fish and Game.

A diversity of birds, mammals, and other animals were killed by the spill or injured by contamination of prey and habitats. Many of these species are dependent on aquatic or intertidal habitats for activities such as feeding and resting, but many also use upland habitats. Protection of upland habitats from further degradation may reduce cumulative effects on injured fish and wildlife populations, and thereby help them recover from the effects of the oil spill. This study focused specifically on marbled murrelets and harlequin ducks, two species known to have been affected by the spill and known to use upland habitats.

Based on surveys of 140 streams, preliminary results of the harlequin duck study indicate that this species nests along larger-than-average anadromous fish streams, with moderate gradients and clear waters. Preliminary results on murrelets suggest that murrelets use slopes facing north or west, and inland areas at the heads of bays as opposed to the outer peninsulas. Open bog meadows, especially at the heads of bays, appear to be used as flight corridors to upper wooded areas.

##### 5. Land Status, Uses, and Management Plans in Relation to Natural Resources and Services

Agencies: Alaska Department of Natural Resources, U.S. Forest Service, U.S. National Park Service, Alaska Department of Fish and Game.

The objective of this study is to locate, categorize, evaluate, and determine the availability of maps, management plans, and other resource documents relevant to restoration planning throughout the oil-spill region. Resource materials identified will assist in planning for and implementing site-specific restoration activities, including direct restoration, replacement, and the acquisition of equivalent resources.

To date, a variety of documents, maps, and management plans have been identified and are being evaluated; other resource materials are being located. This preliminary project will be completed in Spring 1991. A second phase, directly supporting the proposed Restoration Project Number 4, Protection of Strategic Fish and Wildlife

Habitats and Recreation Sites, is under consideration.

### C. 1990 Technical Support Projects

#### 1. Peer Reviewer Process for Restoration Feasibility Studies

Agencies: Alaska Department of Fish and Game, Alaska Department of Environmental Conservation, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency.

This project provided funds to ensure that scientists with expertise on natural resource restoration were available to provide peer review of restoration feasibility projects and other restoration planning studies and activities.

#### 2. Assessment of Beach Segment Survey Data

Agencies: Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, U.S. Forest Service, U.S. Park Service, U.S. Environmental Protection Agency.

The objective of this project is to review and summarize beach survey information (obtained through oil spill response activities) to assist in planning for and implementing site-specific restoration activities, particularly in the area of direct restoration. This study was initiated late in 1990 and continues to date.

A master database is being created from that portion of the beach surveys relevant to restoration. The primary sources of this information are the Alaska Departments of Natural Resources and Environmental Conservation. Data from local and regional governments as well as non-governmental sources will also be reviewed and integrated into the system as appropriate. This preliminary project will be completed in Spring 1991.

3. Development of Potential Feasibility Studies for 1991 Agencies: Alaska Department of Fish and Game, U.S. Environmental Protection Agency, Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, U.S. Forest Service, U.S. Department of Fish and Game, U.S. National Park Service, U.S. National Oceanic and Atmospheric Administration.

This project provided for the orderly development of additional feasibility studies including: (a) Monitoring "natural" recoveries; (b) pink salmon stock identification; (c) herring stock identification/spawning site inventory;

(d) artificial reefs for fish and shellfish; (e) alternative recreation sites and facilities; (f) historic sites and artifacts; and (g) availability of forage fish. Currently feasibility study proposals are under consideration for all of the above themes.

### III. 1991 Restoration Work Plan

The Trustees are currently developing and evaluating restoration planning and implementation activities, which will be described in the 1991 Restoration Work Plan to be published in the *Federal Register* later in the Spring. Planning activities will include feasibility studies, technical support studies, and natural recovery monitoring which will be made available to the public for review and comment. Implementation activities that are now under consideration are presented in this section. The Trustees and EPA are asking, through this notice, for public comment on and additional suggestions for restoration planning and implementation activities for 1991. As noted previously, the Trustees and EPA anticipate publishing later this Spring a notice of the restoration projects identified for implementation in 1991. More detailed descriptions for 1991 restoration projects will be made available to the public for comment.

#### A. 1991 Restoration Planning Activities

The fundamental purpose of restoration planning is to identify and evaluate potential restoration implementation activities, in consultation with technical experts and the public. The integration of results from the damage assessment and other information into restoration planning is critical to the success of the oil spill program. As damage assessment results are reviewed and evaluated, the Trustees will identify potential restoration implementation activities and related feasibility and technical support projects. This process involves ongoing consultation with principal investigators for damage assessment studies, agency experts, and outside peer reviewers to review the nature and extent of oil spill injuries in relation to the biology and ecology of injured species, habitats, and ecosystems. A key goal is to identify life history requirements, limiting factors, and environmental processes that are especially sensitive or that may be enhanced.

Section II describes five feasibility studies carried out in 1990, some of which may continue in 1991. The Trustees and EPA are considering additional feasibility and technical support projects in 1991 and, following additional review, intend to discuss

them in the Spring 1991 *Federal Register* Notice. Studies now being considered concern a variety of resources, including pink salmon, tidal marshes, Pacific herring, bald eagles, recreation, and sea otters. Feasibility and technical support studies will be implemented as damage assessment data and funding become available.

The scientific literature and experience from oil spills other than the *Exxon Valdez* will provide background on restoration and information from other oil spills. In 1991, the Restoration Planning Work Group expects to review and evaluate previously identified literature on restoration (see Appendix B, August 1990 Progress Report) and to continue review and evaluation of literature on species and ecosystem recoveries following anthropogenic and natural environmental disturbances.

Information on the adequacy of natural recovery is central to determining whether to implement restoration actions or to allow injured resources to recover on their own. Direct measures of recovery, such as species distribution, abundance, diversity, growth, reproductive success, or other physiological and biochemical properties, may be appropriate monitoring objectives. In some cases, it is appropriate to indirectly determine the degree of recovery by measuring exposure (presence of oil residuals and/or metabolites) and by applying knowledge or toxicological effects derived from the oil spill literature. For these reasons, the recovery of injured resources can best be followed by implementing a balanced program of monitoring. The duration of recovery monitoring will depend on the time necessary to establish a trend for recovery, and this in turn will necessarily depend on the severity and duration of effects resulting from the oil spill.

Some recovery monitoring studies will be considered for implementation in 1991. As with feasibility and technical support projects, these will be discussed in the March 1991 *Federal Register* document.

Public participation will continue to be an important component of restoration planning in 1991. The Restoration Planning Work Group is interested in and will try to accommodate requests for meetings with individuals or groups. In addition, the Trustees will consider whether and what additional actions, such as publications and workshops, are appropriate and possible in 1991. Requests and suggestions from the public are invited.

### B. 1991 Restoration Implementation Activities

Where the nature of the resource injury is reasonably clear, it may be desirable to begin restoration prior to receipt of funds from the parties responsible for the oil spill. There are several reasons why this may be so.

Failure to undertake timely restoration may allow damages initiated by the spill to continue or accelerate, as in the case of the loss of stabilizing vegetation on beaches. In other cases, protection of strategic habitats, subject to land-use changes, can reduce cumulative stresses on injured resources and maintain, in the near term, a full range of restoration options. Finally, the importance of a resource for subsistence, commercial, or recreational purposes may justify prompt restoration action.

The restoration activities being considered by the Trustees for implementation in 1991 are described below. Before making final decisions for the 1991 program, the Trustees are prepared to conduct public meetings in some of the oil spill communities, if requested to do so. Moreover, the Trustees expect to provide further opportunity for public comment on the 1991 restoration projects after detailed descriptions for each project are available. The projects now under consideration for the initial phase of the restoration process are:

#### 1. Restoration of the Beach Wildrye Community

Lead Agencies: Alaska Department of Environmental Conservation, U.S. Forest Service

##### Need and Objectives:

The high intertidal-supratidal beach wildrye grasses (*Elymus arenarius* and *E. mollis*) communities show signs of localized injury as a result of the Exxon Valdez oil spill and the associated cleanup activities. Injury appears to have resulted from oiling and the stress of mechanical abrasion resulting from oil removal operations carried out by cleanup workers and equipment. Beach wildrye grasses are major contributors to natural beach stability. Injury to this important plant community may result in accelerated erosion of the beaches and adjacent upland plant communities. Also at risk from increased erosion are several nearshore archaeological sites.

Once the beach wildrye root masses are disturbed, natural recovery may be slow, taking several years. Wildrye recolonizes primarily by spreading outward from undamaged plants, and this process can be stopped altogether if the rate of erosion is too great. This may result in a significant loss of intertidal

and supratidal area. Restoration intervention may often stabilize a beach in one growing season.

The objective of this project is to stabilize injured sites where natural or cultural resources are at risk. Specific sites for restoration will be chosen following the 1991 Spring Shoreline Assessment. The Department of Environmental Conservation and the Forest Service are also exploring whether this project may more appropriately be carried out under the State/Federal response program.

##### Methods:

Replanting beach wildrye for stabilization is a proven technology. Nearby healthy stocks of beach wildrye grass will be used as a source of donor material. After replanting, fertilizer will be applied (20-20-10 fertilizer up to 800 pounds per acre) to help the transplanted beach wildrye grass recolonize. At some locations fertilizer alone may be sufficient to encourage existing injured plant communities to recover without transplanting new stock.

Estimated 1991 Cost: \$180,000

#### 2. Public Information and Education for Recovery and Protection of Alaska's Marine and Coastal Resources

Lead Agencies: U.S. Fish and Wildlife Service, U.S. National Park Service, Alaska, Department of Environmental Conservation

##### Need and Objectives:

The Exxon Valdez oil spill caused direct and indirect injury to the marine birds and mammals of southcentral Alaska. The purpose of this project is to make users of the area aware of the changes to the ecosystem resulting from the oil spill and to lessen the potential for additional harmful human disturbances.

##### Methods:

The project's sponsors will publish and distribute information explaining the potential adverse impacts of human activities, and the importance of increased conservation and protection of marine birds and mammals in key habitats in the oil spill area. Print media such as posters, brochures, and possibly books and video tapes will be produced. Consideration will also be given to production of material for school curricula.

Print media will be distributed through traditional outlets including but not limited to refuge, park, and tourist information and visitor centers. Additional distribution will occur at airports, boat harbors, commercial tour operators, and to public agency and private industry training staffs.

Some species identification information will be included but the primary content of the media will emphasize strategies to allow public use and enjoyment of marine birds and mammals while preventing harmful disturbances to these species. Estimated 1991 Cost: \$100,000

#### 3. Salmonid Stocks and Habitat Restoration

Lead Agencies: Alaska Department of Fish and Game, U.S. Forest Service

##### Need and Objectives:

Spawning and nursery areas of wild stocks of pink and chum salmon which were impacted by the Exxon Valdez oil spill occur throughout Prince William Sound, lower Cook Inlet, and the Gulf of Alaska. Pink and chum salmon are major components of the ecosystem, serving as important food sources for other fish, birds, terrestrial and marine mammals. Pink and chum salmon are also harvested by man in subsistence, commercial, and sport fisheries. Since salmon return to the individual streams in which they were born, with little straying to other streams, genetically unique wild salmon stocks will be restored through site specific rehabilitation of salmon spawning and rearing habitats.

##### Methods:

This project consists of several proven fisheries enhancement techniques that may be applied immediately at specific sites. In addition to those sites and streams at which potential rehabilitation activities already have been identified, a survey of affected salmon spawning habitat within the oil spill area will be conducted in 1991 to determine additional restoration measures. The proposed techniques include fish passage through stream channelization or fish ladders to overcome physical and hydrological barriers and construction of spawning channels. All of these measures provide oil-free spawning areas to replace oil-impacted spawning areas. Additional wild salmon stock restoration measures include remote egg-taking and incubation at existing hatcheries for ultimate fry release in oil-impacted streams. Other measures may include optimal fry release programs that will enhance marine survival of juvenile salmonids.

Estimated 1991 Cost: \$1,300,000

#### 4. Protection of Strategic Fish and Wildlife Habitats and Recreation Sites

Lead Agencies: Alaska Department of Fish and Game, Alaska Department of Natural Resources, U.S. Department of the Interior, U.S. Department of Agriculture

**Need and Objectives:**

The marine and intertidal habitats where most oil spill injuries occurred are ecologically linked to adjacent uplands. The water quality in streams and estuaries where salmon spawn depends on the adjacent uplands. Eagles nest and roost in large trees along the coasts and streams, and marbled murrelets nest in association with forested uplands. Harlequin ducks nest in riparian habitats and feed in the streams as well as in nearby intertidal and estuarine areas. Common and thick-billed murres and other seabirds nest on off-shore islands.

Tourism and recreation activities, such as sport fishing and camping, also depend on the quality and accessibility of shorelines and uplands. The diversity, productivity, and uses of intertidal and estuarine habitats, and of freshwater streams along the coast depend on the ecological integrity of the adjacent uplands. Continued productivity in the undamaged parts of the regional ecosystem, including strategic marine, intertidal, and estuarine habitats and adjacent uplands, may be necessary for the recovery of biological communities that were injured.

During the public scoping process the governments received many restoration suggestions that involved the protection and prime fish and wildlife habitats, recreation sites, and adjacent uplands. Suggested approaches to this protection included land acquisition and changes in management practices.

Land-use activities may occur in the oil spill area in 1991 or 1992. These activities may impact important habitats and recreation sites or slow the recovery of spill-injured resources.

The objective of this project is to identify and protect strategic wildlife and fisheries habitats and recreation sites and to prevent further potential environmental damages to resources injured by the *Exxon Valdez* oil spill. This project will be preceded by a technical support project to identify and evaluate potential properties which if publicly owned will contribute to this objective. Where acquisition of property

rights is determined to be appropriate, they will be acquired on a willing buyer/willing seller basis. Primary considerations in deciding which properties should be acquired during this project will include (1) the nature and immediacy of changes in use that may further affect resources injured by the oil spill and (2) the prospect that failure to act will foreclose restoration opportunities.

The Trustees have developed the following preliminary sequence of steps for use in identifying and protecting strategic fish and wildlife habitats and recreation sites:

1. Identification of key upland habitats that are linked to the recovery of injured resources or services by scientific data or other relevant information.

2. Characterization and evaluation of potential impacts from changed land use in relation to their effects on recovery of the ecosystem and its components; comparative evaluation of recovery strategies not involving acquisition of property rights (e.g., redesignation of land use classification), including an assessment of protection afforded by existing law, regulations, and other alternatives.

3. Evaluation of cost-effective strategies to achieve restoration objectives for key upland habitats, identified through steps one and two above. This would include evaluation of other restoration alternatives for these resource injuries.

4. Willing seller/buyer negotiations with private landowners for property rights.

5. Incorporation of acquired property rights into public management.

Habitat and recreation site acquisition proposals that meet the appropriate evaluation factors for restoration (see section 2) will be identified and assigned by priority for implementation in accordance with this preliminary five-step process and applicable State and Federal laws and regulations.

The geographic scope of the 1991 project will be the oil spill area. Subsequent to this initial effort, the

Trustees will continue to survey potential acquisitions, including acquisitions outside the spill area. Estimated Cost: To be determined

**C. Funding for the 1991 Restoration Work Plan**

Although it is expected that the responsible parties will pay for the costs of the damage assessment and restoration program, there is no certainty about the final amount and when such funds will be forthcoming. It is possible, therefore, that funds to carry out the 1991 Restoration Work Plan, including the proposed planning and implementation activities, will have to be advanced by the State and Federal governments. To date, those funds have not been committed or secured by either government.

**D. References**

The documents listed below provide additional information on damage assessment and restoration. They are available from the Oil Spill Public Information Center, The Simpson Building, 645 G Street, Anchorage, Alaska, 99501.

1. "The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plan for the *Exxon Valdez* Oil Spill, Volume I Assessment and Restoration Plan Appendices A, B, C."
2. "State/Federal Natural Resource Damage Assessment Plan for the *Exxon Valdez* Oil Spill," August 1989.
3. "Restoration Planning following the *Exxon Valdez* Oil Spill: August 1990 Progress Report."
4. "Restoration following the *Exxon Valdez* Oil Spill: Proceedings of the Public Symposium," July 1990.

Dated: February 26, 1991.

**Lajuana S. Wilcher,**

*Assistant Administrator, Office of Water, U.S. Environmental Protection Agency.*

Dated: February 25, 1991.

**Charles E. Cole,**

*Attorney General, State of Alaska.*

[FR Doc. 91-5014 Filed 2-28-91; 8:45 am]

BILLING CODE 6500-50-M





RPWG  
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## OIL SPILL RESTORATION PLANNING OFFICE

437 E Street, Suite 301 Anchorage, Alaska 99501  
(907) 271-2461 FAX: (907) 271-2467

March 7, 1991

Dear Concerned Citizen:

Based on your past interest in the planning of restoration following the Exxon Valdez Oil Spill, we are enclosing, for your information, a copy of this recent notice announcing a draft 1991 Restoration Work Plan. The Restoration Planning Work Group is interested in your continued input in this process and look forward to receiving your comments. On behalf of the Work Group, we appreciate your interest.

Sincerely,

Stanley E. Senner  
Alaska Department of Fish & Game

Linda R. Comerci  
U.S. Environmental Protection Agency

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FIRE INSPECTOR -

FIRE DEPT. - 522-1122

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2/4/91

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3/1/91  
FR Notice

Not reviewed by MT or TC

NRWG  
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EPA - MACMULLIN  
DRAFT DETAILED OUTLINE FOR FR NOTICE  
NOVEMBER 9, 1990

FEDERAL REGISTER NOTICE -- Draft Outline  
Draft Restoration Work Plan and Proposed  
1991 Restoration Program

I. Introduction [Brian et.al.] Susanu

Purpose of this notice

- Present draft restoration work plan and 1991 restoration program for public comment
- To report on the results of 1990 RPWG activities and projects

Background Kirsten/Janet

- Spill statistics, cleanup efforts etc.process

II. Restoration Plan Development Process (N.B. This section will provide the public with an understanding of the overall process. After reading this, the reader should be able to understand where the individual activities fit into the restoration process. Also, it should be evident to the reader that this document is an interim product and not the draft version of the final restoration plan which is tied to settlement.) [Brian et.al. and Ken Rice for the Compliance section]

Introduction

- Relationship to response and damage assessment Brian
- Dynamic process, information still being assessed
- Leads to final restoration plan after settlement of damage claim
- Commitment to public involvement
- Timeline

Identification of need for restoration Linda or Ruth

- NRDA data, feasibility studies, literature review, shoreline surveys etc.

Development of alternatives Linda

- Public involvement
- Workshops and reports
- Literature review
- Summary of restoration alternatives proposed today



EPA - MACMULLIN  
DRAFT DETAILED OUTLINE FOR FR NOTICE  
NOVEMBER 9, 1990

Evaluation of alternatives

- Three types of restoration *Martha*
- Burden of proof/application of factors to be *Martha* considered
- Matrix approach/ PI and peer review meetings *Linda*
- Feasibility studies *Kirsten*
- Literature reviews *Linda*
- Summary of proposed restoration projects presented for public comment *Brian/Susan*
  - Peer review process/public comment (through FR notice)

Compliance (Explaining how we interpret the NEPA statute and the Federal governments and State compliance actions with CZM etc.) [**Ken Rice**] *w. Martha's help*

Implementation options *Brian*

Plans for final restoration plan after settlement *Brian*

III. Summary of 1990 Restoration Work [**Brian et.al. with the Principal Investigators**] *w. Ruth, if available*  
Activities  
Projects

IV. Proposed 1991 Restoration Program

Introduction [**Brian**]  
Restoration project (6 categories) [**Agency representatives. Decision of form needed. Proposals due on 11/15 or 16.**]  
Feasibility projects [**Agency representatives**]  
Technical support projects [**Agency representatives**]  
Recovery monitoring [**John Strand**]  
Peer Review [**Brian or Stan**]  
Public comment/involvement/participation [**Sandy**]

V. Future Restoration Process [**Brian et.al.**] *w. Ruth, if available*  
(Refer back to section II and include a more specific discussion)

VI. Request for Public Comment *Susan (to be written after other sections.)*

APPENDIX: Description of Proposed 1991 Projects [**Agency Representatives**]

Spies     Marthi  
Brian     Liza  
Stan     Jim N.  
Sandy

Restoration Planning Work Group  
Draft Outline for FR Notice  
November 9, 1990

Not reviewed by MT or TC

Federal Register Notice Outline: Draft Restoration Work Plan and Proposed 1991 Restoration Program

I. Introduction

- Purpose of this FR notice
- Background

II. Restoration Plan Development Process

- Introduction
- Identification of the Need for Restoration
- Development of Alternatives
- Evaluation of Alternatives
- Implementation Options
- Compliance

III. Summary of 1990 Restoration Work

- Activities
- Projects

IV. Proposed 1991 Restoration Program

- Introduction
- Restoration projects
- Feasibility projects
- Technical support projects
- Recovery monitoring
- Peer review
- Public comment/involvement/participation

V. Future Restoration Process (refer back to section II and include a more specific discussion)

VI. Request for public comment

APPENDIX: Description of Proposed 1991 Projects

Category A: Favorable Recommendation should be written up in proper format  
 Note: Everything is subject to reconsideration before recommendations  
 go to Management Team.

Title	Proposal Received?	Type	Disposition
<i>RECREATION</i>			
Site Restoration-Restore Contours, etc.	Y		Rest.
<i>ARCHAEOLOGY/CULTURE</i>			
Protection From Vandalism			
Education, Enforcement & Stewardship	N		Rest
Erosion Control	N		Rest
Data Collection			
Excavation	N		Rest
<i>FISH/SHELLFISH</i>			
Natural Recovery Monitoring	Y		Mont
Herring Management/Protection	N		Rest
Herring Stock Identificaiton	Y		Study
Coded Wire Tag for Salmon	Y		Study
Spawner Protection (aerial Surveys	N		Study
PIT Tagging for Salmon	Y		Study
Herring Egg/Substrate Transplants	Y		Study
Otolith Marking for Salmon	Y		Study
<i>COASTAL HABITATS</i>			
Beach Rye Revegetation	Y		Rest
<i>BIRDS</i>			
<i>MARINE MAMMALS</i>			
<i>MULTIPLE CATEGORIES</i>			
Public Education (Multiple componets)			
Archaeology	N		Rest
Recreation	N		Rest
Birds and Mammals	N		Rest

Category B Proposals

**DRAFT Category B Proposals**

Category B: Possible Recommendation for 1991 program (not necessarily in same form); need additional information before RPWG can decide information to come from RPWG member or by request to PI, etc.

<b>Title</b>	<b>Proposal Received?</b>	<b>Type</b>	<b>Disposition</b>
<i>RECREATION</i>			
Marine Debris-Trash removal	N	Rest	
Site Restoration-Restore Contours	Y	Rest	
Restore/Replace Public Facilities	N	Rest	
User Survey	N	Study	

*ARCHAEOLOGY/CULTURE*

*FISH/SHELLFISH*

Enhancement			
Piggot Bay Spawing Channel	N	Rest	
Harrison Creek Diversion	N	Rest	
Chalmers River Chum Reintro	N	Rest	
Rockfish Transplants	Y	Study	
Herring Logging Effects	Y	Study	
Trout Streams Rehab	N	Rest	
Coho Habitat Improvement	N	Rest	

*COASTAL HABITATS*

*MARINE MAMMALS*

*BIRDS*

*MULTIPLE CATEGORIES*

**CATEGORY C:**

Definite value for restoration; may be more appropriately carried out as Damage Assessment or Response; the main objective is to get the work done

Title	Proposal	
	Received	Type Disposition
<i>RECREATION</i>		
Site Restoraion- Restore Contours	Y	Rest
User Survey	N	Study

*ARCHAEOLOGY/CULTURE*

*FISH/SHELLFISH*

*COASTAL HABITATS*

*MARINE MAMMALS*

*BIRDS*

*MULTIPLE CATEGORIES*

**CATEGORY C:**

Cannot recommend favorably now; may be appropriate some time, but not in 1991 program; currently does not meet criteria; do not anticipate having new information that would change that conclusion with respect to the 1991 program

Title	Proposal Received?	Type	Disposition
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*RECREATION*

Marine Debris-Garbage Removal (boats)	N		Rest.
Site Restoration-Drinking Water Survey	N		Study
Modify Management Plans (also see Multiple Categories)	N		Rest

*ARCHAEOLOGY/CULTURE*

Data Collection			
Inventory artifacts in Private Collections	N		Study
Education			
Traditional Skills	N		Rest
Oral History	N		Rest

*FISH/SHELLFISH*

Sportfish- Public Access	Y		NC
Clam Transplants	N		Study
Rockfish Transplants	Y		Study
Sportfish Access Acquisiton	N		Rest
Herring Logging Effects	Y		Study
Artificial Reefs	Y(old Prop)		Study

*COASTAL HABITATS*

*MARINE MAMMALS*

*MULTIPLE CATEGORIES*

*BIRDS*

Category E Proposals DRAFT

Category E: Not considered at Restoration Synthesis meeting (due to time constraints); need to get write-ups or at least descriptions in advance of RPWG meeting in mid-November.

Title	Proposal Received?	Type	Disposition
<i>RECREATION</i>			
<i>ARCHAEOLOGY/CULTURE</i>			
<i>FISH/SHELLFISH</i>			
<i>COASTAL HABITATS</i>			
Fucus Recovery by remote sensing	N	Mont	
<i>BIRDS</i>			
Identificaion of Bald Eagle Habitats	Y	Study	
Population Recovery for Bald Eagles	Y	Mont	
Population recovery for marine birds			
Oystercatches	Y	Mont	
Kittiwakes	N	Mont	
Guillemonts	N	Mont	
Murrelets	N	Mont	
Marbleled Murrelet nesting Habitat	Y	Study	
Identify, describe & rank seabird			
Colonies and other critical areas			
for possible acquisition	N	Study	
Review Marine Sanctuary and other			
designations to protect marine bird			
Habitats	N	Study	
Educate tour boat operators & others			
re: disturbance, conservation, etc.	N	Study	
Importance of harvest of Marine birds			
and waterfowl			
Characterize Harlequin Duck Nesting			
Habitat	N	Study	
<i>MARINE MAMMALS</i>			
Sea otter habitat ID & Priority	Y	Study	
Sea otter Population Recovery	Y	Mont	
Sea otter life history	Y	Study	



*MARINE MAMMALS (con'd)*

Sea Otter Assessment & Recovery

Population assessment	Y	Mont
Foraging	Y	Study
Blood	Y	?
Tissue Toxicology	Y	?
Mortality	Y	?
Prey Selection	Y	Study
Habitat determination	Y	Study
Marine Mammal aerial/boat surveys	Y	?

*MULTIPLE CATEGORIES*

Acquisition of strategic areas & Habitats	N	Rest
Aerial/boat surveys for Birds/mammals	Y	Mont
Hydrocarbon Exposure		
Fish/Shellfish	N	Mont
Birds	N	Mont
Mammals	N	Mont
Phase II of current Land Status Study (including review of Management Plans)	N	Study
Review & Recommend designations (e.g. Marine sanctuaries, critical habitats) to protect marine/coastal habitats for birds, mammals, etc.	N	Study

This draft includes proposals not listed on Stan's list.

Category E: Not considered at Restoration Synthesis meeting (due to time constraints); need to get write-ups or at least descriptions in advance of RPWG meeting in mid-November.

Title	Proposal Received?	Type	Disposition
<i>RECREATION</i>			
<i>ARCHAEOLOGY/CULTURE</i>			
<i>FISH/SHELLFISH</i>			
King Crab Rehabilitation Feasibility study			
Restoration of Dolly Varden Char and cutthroat trout populations in PWS			
Weir enumeration of salmon escapements in PWS			
Ground Enumeration of salmon escapements in PWS			
<i>COASTAL HABITATS</i>			
Fucus Recovery by remote sensing	N		Mont
Monitoring Natural Recovery of Subtidal Marine sediment resources in PWS			
Restoration of Tidal Marshes affected by the EVOS			
Exxon Valdez crude oil in sediments and mussels; and rates of recovery of impacted biota on selected intertidal beaches in PWS			
<i>BIRDS</i>			
Identificaiton of Bald Eagle Habitats	Y		Study
Population Recovery for Bald Eagles	Y		Mont
Population recovery for marine birds			
Oystercatches	Y		Mont
Kittiwakes	N		Mont
Guillemonts	N		Mont
Murrelets	N		Mont
Marbleled Murrelet nesting Habitat	Y		Study
Identify, describe & rank seabird Colonies and other critical areas for possible acquisition	N		Study
Review Marine Sanctuary and other designations to protect marine bird Habitats	N		Study
Educate tour boat operators & others re: disturbance, conservation, etc.	N		Study
Importance of harvest of Marine birds and waterfowl			

Characterize Harlequin Duck Nesting  
 Habitat N Study  
 Identification AND protection of important bald eagle habitats  
 PWS Harlequin duck restoration Study  
 Removal of introduced animals on selected colonial seabird nesting islands  
 Reduction of potential sources of disturbances for bald eagles in the EVOS area  
 Recolonization or restoration of normal densities and reproductive behavior  
 of Alaskan Murre Colonies

*MARINE MAMMALS*

Sea otter habitat ID & Priority Y Study  
 Sea otter Population Recovery Y Mont  
 Sea otter life history Y Study  
 Sea Otter Assessment & Recovery  
 Population assessment Y Mont  
 Foraging Y Study  
 Blood Y ?  
 Tissue Toxicology Y ?  
 Mortality Y ?  
 Prey Selection Y Study  
 Habitat determination Y Study  
 Marine Mammal aerial/boat surveys Y ?  
 Determination of Key Sea Otter prey species in Western PWS for enhancement of  
 restoration on non-contaminated sea otter habitat  
 Consumption of contaminated prey by sea otters living in areas affected by the EVOS  
 Variation in effects of oil exposure among sea otters living in areas affected by EVOS  
 Determination of sea otter foraging depth in Western PWS for population and habitat restoratio

*MULTIPLE CATEGORIES*

Acquisition of strategic areas & Habitats N Rest  
 Aerial/boat surveys for Birds/mammals Y Mont  
 Hydrocarbon Exposure  
 Fish/Shellfish N Mont  
 Birds N Mont  
 Mammals N Mont  
 Phase II of current Land Status Study  
 (including review of Management Plans) N Study  
 Review & Recommend designations (e.g.  
 Marine sanctuaries, critical habitats)  
 to protect marine/coastal habitats  
 for birds, mammals, etc. N Study  
 Development of a conceptual ecosystem model for PWS  
 Public Information

DRAFT -- 11/12/90

For review by MT on 11/13

MEMORANDUM

TO: Grayson R. Cecil

FROM: Paul E. Gertler -- for the Federal Members of the Management Team

SUBJECT: Draft Agenda for the Federal Trustees Meeting

Thank you for providing us with the opportunity to comment on the draft agenda for the November 15 Federal Trustees meeting in Seattle. We are requesting that the following items be added to the agenda:

1. Washington Policy Group -- Trustee Council relationship and communications. We recommend that this be the first item on the agenda and that it may best be discussed in an executive session between the Washington Policy Group and Trustee Council.
2. Natural Resource Damage Assessment Planning Process: We recommend that this item either precede or follow agenda item III, Restoration Planing Process. I will be prepared to make this presentation for the Management Team, if appropriate.
3. Agency Natural Resource Damage Assessment and Restoration Budget Requirements. We recommend that this either precede or follow agenda item IV. [REDACTED] will be prepared to make this presentation.

In light of the brief time available to discuss many items of importance, we recommend that the agenda items be presented by priority and that you consider postponing the discussion of agenda item V until after the next technical committee meeting with Exxon which is scheduled for November 27th and 28th. Please call me at 907/786-3579 if you have any questions about these items or recommendations. We look forward to meeting with you and are confident that it will be a positive and productive session.

cc: Mike Barton  
 Al Ewing  
 Dave Gibbons  
 Susan MacMullin  
 Byron Morris  
 Steve Pennoyer  
 Cordell Roy  
 Walter Stieglitz



exemption (TME) under section 5(h)(1) of the Toxic Substances Control Act (TSCA) and 40 CFR 720.38. EPA designated the original test marketing application as TME-89-26. The test marketing conditions are described below.

**EFFECTIVE DATE:** October 9, 1990.

**FOR FURTHER INFORMATION CONTACT:** Andrea Pfahles-Hutchens, New Chemical Branch, Chemical Control Division (TS-794), Office of Toxic Substances, Environmental Protection Agency, Rm. E-611, 401 M St., SW., Washington, DC 20460, (202) 382-2255.

**SUPPLEMENTARY INFORMATION:** Section 5(h)(1) of TSCA authorizes EPA to exempt persons from premanufacture notification (PMN) requirements and permit them to manufacture or import new chemical substances for test marketing purposes if the Agency finds that the manufacture, processing, distribution in commerce, use and disposal of the substances for test marketing purposes will not present an unreasonable risk of injury to health or the environment. EPA may impose restrictions on test marketing activities and may modify or revoke a test marketing exemption upon receipt of new information which casts significant doubt on its finding that the test marketing activity will not present an unreasonable risk of injury.

EPA hereby approves the modification of the test marketing period for TME-89-26. EPA has determined that test marketing of the new chemical substance described below, under the conditions set out in the TME application, and for the modified time period specified in the modification request, will not present an unreasonable risk of injury to health or the environment. Production volume, use, and the number of customers must not exceed that specified in the application. All other conditions and restrictions described in the original notice of approval of test marketing application remain the same.

**T-89-26**

*Notice of Approval of Original Application:* October 10, 1989 (54 FR 42840).

*Modified Test Marketing Period:* Confidential.

*Commencing on:* Confidential.

The Agency reserves the right to rescind approval or modify the conditions and restrictions of an exemption should any new information come to its attention which casts significant doubt on its finding that the test marketing activities will not present

an unreasonable risk of injury to health or the environment.

Dated: October 9, 1990.

John W. Melone,

Director, Chemical Control Division, Office of Toxic Substances.

[FR Doc 90-27203 Filed 11-16-90; 8:45 am]

BILLING CODE 6560-60-F

[WH-FRL-3861-4]

**Prince William Sound and Gulf of Alaska; Restoration Work Plan and Program**

**AGENCY:** Environmental Protection Agency and Alaska Department of Fish and Game.

**ACTION:** Notice of intent to prepare a draft restoration work plan and to propose a 1991 restoration program.

**SUMMARY:** The Environmental Protection Agency (EPA), on behalf of the Federal trustees (the Departments of the Interior and Agriculture and the National Oceanic and Atmospheric Administration) and the Alaska Department of Fish and Game (ADF&G), on behalf of the State Trustee, are announcing the intent of the Federal and State governments to prepare a draft restoration work plan for the Prince William Sound and the Gulf of Alaska, and to propose a restoration program for the 1991 field season.

**DATES:** The Federal and State of Alaska governments intend to jointly publish a draft restoration work plan and a restoration program for the 1991 field season in the Federal Register on or about December 28, 1990, and will accept comments on the draft plan and proposed 1991 projects for 30 days after the publication of that notice.

**FOR FURTHER INFORMATION CONTACT:** Susan MacMullin—EPA, Washington, DC (202/483-7166) or Stanley Senner—ADF&G, Anchorage, AK (907/271-2461).

**SUPPLEMENTARY INFORMATION:**

**I. Background**

The March 24, 1989, grounding of the tanker *Exxon Valdez* in Alaska's Prince William Sound caused the largest oilspill in U.S. history. A slick containing about 11 million gallons of North Slope crude oil covered the western portion of the Sound and moved to Cook Inlet and along the Gulf of Alaska. More than 1,000 miles of shoreline were affected, including State and national forests, wildlife refuges, and parks. The spill damaged areas extremely rich in natural resources. It injured fish, birds, mammals, intertidal and subtidal plants and animals and their associated habitats. The area's important historical

and archaeological resources also were injured as a result of oiling and cleanup activities. The oil also adversely affected intrinsic values.

Soon after the spill occurred, President Bush and Alaska Governor Cowper expressed the desire that the environment and economy of Prince William Sound and the Gulf of Alaska be fully restored. Responsibility for full restoration of these natural resources and the services they provide rests with Federal and State agencies.

Both Federal and State law provide authority for response, damage assessment, and restoration actions undertaken following the *Exxon Valdez* oilspill. Under Federal law, section 107(f) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and section 311(f) of the Federal Water Pollution Control Act (Clean Water Act) provide for Federal and State officials to act as trustees on behalf of the injured, lost and destroyed natural resources and to pursue recovery of damages for injury, loss or destruction of these resources. Federal law authorizes the State and Federal governments to present claims to the responsible parties for damages for injury, loss or destruction of natural resources and their uses. The funds received from these claims must be used to restore, replace or acquire the equivalent of the natural resources and services injured, lost or destroyed by the spill.

CERCLA applies to releases of hazardous substances other than oil, while the Clean Water Act applies to oilspills. Both laws are supplemented by the National Contingency Plan (40 CFR part 300) and the Natural Resource Damage Assessment (NRDA) regulations (43 CFR part 11) which set out a process, which is not mandatory, for determining proper compensation to the public for injury, loss or destruction of natural resources. In this case, the natural resource trustees have not made a final decision on whether to follow the NRDA regulations. In combination, these laws and regulations provide the structure for the Federal/State response, damage assessment, and restoration activities following the *Exxon Valdez* oilspill.

Restoration (including actions to restore, replace or acquire the equivalent of resources) is one component of this process. Combined with response, cleanup and the damage assessment process, these efforts seek to minimize adverse impacts and compensate the public for natural resource injury, loss, or destruction and

lost use and intrinsic values, by restoring the resources and the services they provide.

Response activities include the initial emergency measures to contain the spilled oil and minimize adverse impacts, as well as the subsequent efforts to clean up oil from the spill area. The magnitude of and circumstances surrounding the *Exxon Valdez* oil spill resulted in relatively little of the spilled oil being contained. Consequently, cleanup activity has focused primarily on removing oil from the shoreline areas affected by the spill. Cleanup activities continued through the summer of 1990 and are expected to resume next year.

In 1989, State and Federal natural resource trustee agencies initiated scientific studies after the oil spill to assess the amount of damage. Most of these studies were continued into 1990, with a number of new studies being initiated as well. This damage assessment process, which is comprised of data collection and analysis components, will continue in 1991. It is designed to identify and quantify the specific resource injury, loss, or destruction and to determine corresponding monetary values. These monetary values include restoration costs, as well as lost-use and intrinsic values. Claims for those damages will be presented to the responsible parties, and under Federal law, the monies received must be used for restoration, replacement or acquisition of equivalent resources.

Restoration builds upon the spill response and damage assessment process by planning for, and then implementing, activities to restore the injured, lost or damaged environment.

The NRDA regulations define "restoration" or "rehabilitation" as . . . "actions undertaken to return an injured resource to its baseline condition as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided . . ." The preceding definition of restoration from the NRDA regulations is provided in this notice for informational purposes. As mentioned earlier, the NRDA regulations are not mandatory.

Generally, the concept of "restoration" includes direct restoration, replacement and the acquisition of equivalent resources:

- Direct restoration refers to measures, in addition to response actions, taken, usually on-site, to directly rehabilitate an injured, lost or destroyed resource.
- Replacement refers to substituting one resource for an injured, lost or

destroyed resource of the same or similar type.

• Acquisition of equivalent resources includes the purchase or protection of resources to enhance the recovery, productivity, and survival of the ecosystems affected by the oil spill.

The goal of the restoration planning effort is to identify appropriate measures that can be taken to restore natural resources affected by the *Exxon Valdez* oil spill. Specific objectives include:

- Identify or develop technically feasible restoration options for natural resources and services potentially affected by the oil spill.
- Determine the nature and pace of natural recovery of injured resources, and identify where direct restoration measures may be appropriate.
- Incorporate an approach to restoration that, where appropriate, focuses on recovery of ecosystems, rather than on the individual components of those systems.
- Identify the costs associated with implementing restoration measures, in support of the overall natural resource damage assessment process.
- Encourage, provide for and be responsive to public participation and review during the restoration planning process.

Among the documents now available on the restoration program are several compiled by the Restoration Planning Work Group (RPWG), which is composed of representatives from the U.S. Departments of Agriculture and the Interior, NOAA, EPA and the Alaska Departments of Environmental Conservation, Fish and Game, and Natural Resources. The RPWG is responsible for planning for the restoration of the areas affected by the *Exxon Valdez* oil spill. To that end, the RPWG has undertaken to gather and develop information on all aspects of restoration related to oil spills.

During the past 18 months, EPA conducted a computerized literature search to identify restoration approaches that have potential for success, as well as actions to avoid. The databases searched were: Aquatic Science Abstracts (1978-1988), BIOSIS Previews (1970-1990) Environmental Bibliography (1969-1989), ENVIROLINE (1970-1989), Pollution Abstracts (1970-1990), and NTIS (1964-1990). The search yield approximately 450 publications. EPA then reviewed the titles and abstracts and identified the most relevant publications for acquisition and detailed review. Articles were selected according to the following criteria:

- Techniques potentially applicable to sub-arctic conditions;

• Restoration of the same resources as those that may have been damaged by the *Exxon Valdez* oil spill;

• Creation of new aquatic habitats (by dredge-and-fill techniques, construction of artificial reefs, etc);

• success of organisms grown in or transplanted to oil-contaminated substrates;

• Approaches and techniques for long-term monitoring studies.

This selective bibliography (approximately 200 citations) is found in appendix A to this notice. The full bibliography of about 450 citations (Item 1, appendix B) is available as noted in appendix B.

The RPWG has developed two reports which are publicly available. One documents the proceedings of an oil spill restoration symposium held on March 26-27, 1990, in Anchorage, Alaska (Item 2, appendix B). The symposium began with introductory statements by Dennis Kelso, Commissioner of the Alaska Department of Environmental Conservation, and Tom Dunne, Acting Regional Administrator of the U.S. Environmental Protection Agency. These opening remarks described the restoration planning process and its objectives. Three keynote speakers addressed the symposium on legal issues related to the damage assessment and restoration process, experiences with restoration of nonmarine ecosystems and public participation in the planning process. A final keynote speaker provided an overview of restoration concepts.

Panel discussions comprised the remainder of the symposium. Sessions addressed direct and indirect restoration of six categories of resources or their uses: Coastal habitats, fisheries, marine and terrestrial mammals, birds, cultural resources and recreation uses. Panelists included experts on restoration in each of these six categories, as well as representatives from various resource user groups, Alaska Native corporations, public land managers, environmental interest groups and the timber and tourism industries. All panel sessions included opportunities for questions and comments from the public, and an extended public comment session took place at the end of the symposium.

Restoration concepts and ideas discussed at the symposium can be grouped into three categories. Broad restoration approaches and philosophies; recommendations for public participation during the restoration planning process; and addressing restoration of specific



resources (e.g., fisheries, mammals, cultural resources).

The second report is the August 1990 progress report, "Restoration Planning Following the Exxon Valdez Oil Spill" (Item 3, appendix B), which summarizes the RPWG activities to date. Its chapters present discussions on public participation programs, a technical workshop, the literature review, and restoration feasibility studies. The report also organizes a possible restoration program in a series of matrices for birds, mammals, fish and shellfish, coastal habitats, recreational uses, cultural resources and multiple resources and values. Within each matrix, categories of potentially injured, lost or destroyed resources are cross-referenced to potential restoration approaches.

The report also offers a discussion of future restoration planning activities, including the evaluation and selection of restoration options and development of a final restoration plan.

The RPWG has undertaken a series of restoration studies designed to assess the potential of direct restoration techniques for some of the resources injured by the oil spill. The study titles are as follows:

Restoration Feasibility Study No. 1.	Re-establishment of <i>Fucus</i> in Rocky Intertidal Ecosystems.
Restoration Feasibility Study No. 2.	Re-establishment of Critical Fauna in Rocky Intertidal Ecosystems.
Restoration Feasibility Study No. 3.	Identification of Potential Sites for Stabilization and Restoration of Beach Wild Rye.
Restoration Feasibility Study No. 4.	Identification of Upland Habitats used by Wildlife Affected by the Exxon Valdez oil spill.
Restoration Feasibility Study No. 5.	Land Status, Uses, and Management Plans in Relation to Natural Resources and Service.

These Restoration Technical Support Projects are also being carried out in 1990. The first project will support development of detailed plans for potential restoration studies in 1991, including, but not limited to:

- "Natural recovery" monitoring;
- Pink salmon stock identification;
- Herring stock identification/spawning site inventory;

- Artificial habitat construction for fish and shellfish;
- Alternative recreation site/facility identification;
- Historic site/artifact restoration; and,
- Forage fish availability.

A second Restoration Technical Support Project will develop and implement a scientific peer review process for the feasibility studies and potential restoration projects.

The third Restoration Technical Support Project will assess and summarize existing beach segment survey data to identify sites for future restoration projects.

These studies are summarized in the document "The 1990 State/Federal Natural Resource Damage Assessment and Restoration Plans for the Exxon Valdez Oil Spill (Item 4, appendix B). Included in this document are responses to public comments received concerning the 1989 damage assessment report (Item 5, appendix B). Commenters responded to a general section that briefly discussed restoration planning as a goal for the upcoming year.

## II. Notice of Intent to Publish a Draft Restoration Work Plan and a Proposed Restoration Program for the 1991 Field Season

EPA, on behalf of the Federal trustee agencies, and ADF&G, on behalf of the State Trustee, are announcing the intent of the Federal and State of Alaska governments to jointly publish in the Federal Register on or about December 28, 1990 the following:

- A draft restoration work plan that addresses appropriate steps for long-range restoration or Prince William Sound and the Gulf of Alaska.
- A proposed restoration program for the 1991 field season.

The draft restoration work plan is expected to provide the public with information about the restoration plans of the Federal and State trustees and identify a proposed program, including restoration projects, that may be implemented in 1991. Development of this work plan is not required by the NRDA regulations. The Federal and State governments expect the parties responsible for the oil spill to pay for these projects.

The State and Federal governments will request public comment on restoration priorities and methods upon the publication of the draft restoration work plan in the Federal Register. The restoration work plan will not be the final restoration plan, but an opportunity for further public participation in the restoration planning process.

Dated: October 24, 1990.

**LaJuana S. Wilcher,**  
Assistant Administrator, Office of Water,  
Environmental Protection Agency.

Dated: October 30, 1990.

**Gregg K. Erickson,**  
Director, Division of Oil Spill Impact  
Assessment and Restoration, Alaska  
Department of Fish and Game.

## Appendix A

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- Item 3: "Restoration Following the Exxon Valdez Oil Spill: August 1990 Progress Report." Prepared by the RPWG, August 1990.
- Item 4: "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill—Sept. 1990." Trustee Council.
- Item 5: "State/Federal Natural Resource Damage Assessment Plan for the Exxon Valdez Oil Spill—Aug. 1989." Trustee Council.

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## FEDERAL RESERVE SYSTEM

### Central Bancshares of the South, Inc., et al.; Acquisitions of Companies Engaged in Permissible Nonbanking Activities

The organizations listed in this notice have applied under § 225.23 (a)(2) or (f) of the Board's Regulation Y (12 CFR 225.23 (a)(2) or (f)) for the Board's approval under section 4(c)(8) of the Bank Holding Company Act (12 U.S.C. § 1843(c)(8)) and § 225.21(a) of Regulation Y (12 CFR 225.21(a)) to acquire or control voting securities or assets of a company engaged in a nonbanking activity that is listed in § 225.25 of Regulation Y as closely related to banking and permissible for bank holding companies. Unless otherwise noted, such activities will be conducted throughout the United States.

Each application is available for immediate inspection at the Federal Reserve Bank indicated. Once the application has been accepted for processing, it will also be available for inspection at the offices of the Board of Governors. Interested persons may express their views in writing on the question whether consummation of the proposal can "reasonably be expected to produce benefits to the public, such as greater convenience, increased competition, or gains in efficiency, that outweigh possible adverse effects, such as undue concentration of resources, decreased or unfair competition, conflicts of interests, or unsound banking practices." Any request for a hearing on this question must be accompanied by a statement of the reasons a written presentation would not suffice in lieu of a hearing, identifying specifically any questions of fact that are in dispute, summarizing the evidence that would be presented at a hearing, and indicating how the party commenting would be aggrieved by approval of the proposal.

Unless otherwise noted, comments regarding each of these applications

## Appendix B

Item 1: "Ecological Restoration of PWS and the COA: An Annotated Bibliography of Relevant Literature." RPWG and EPA-ORD, March 1990.

Item 2: "Restoration Following the Exxon Valdez Oil Spill: Proceedings of the Public Symposium." Prepared by the RPWG, July 1990.